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Vol. V | September, 1916 | No. 9

The Lesson-Plan for Inexperienced Teachers

Ernest Lavern Bowman, State Supervisor Industrial Education, Harrisburg, Pa.

BY the term *Lesson-plan* is meant the written design or scheme whereby the teacher indicates the aim, scope of preparation, and methods of presentation of a given lesson. The usefulness of this practice will at once become apparent when we consider that it will serve to crystallize and fix the many schemes and devices to be used in teaching the lesson; that it will permit the methods of the teacher to be analyzed, inspected and criticised by himself or another; and that it will encourage the preservation of useful material for future use. McMurry says "A carefully considered plan is a means to securing freedom to follow any one of several courses."

Importance to the Inexperienced Teacher. It is especially important that the inexperienced teacher map out carefully just how a lesson is to be presented. A well prepared plan helps materially in overcoming the feeling of nervousness and insecurity so common in the first year's work.

Preparation of the Lesson-plan. The inexperienced teacher is usually furnished a list of topics or paragraphs indicating the extent of the material he is expected to cover in his classes during the year. In the absence of such a list it will be necessary for him to draw upon his own experience and the best textbooks on the subject to make out such a list of topics. A careful study of this subject-matter will disclose that it may be broken up into parts. Each of these parts will possess unity, and will form the theme for a lesson. Let it be understood, however, that it may be found necessary and wise to present two or more lessons, employing as many lesson-plans, in a three-hour period.

Given the subject matter for the lesson, a close study should be made of it, until the teacher is perfectly familiar with the diction and content of the text. Parallel and illustrative matter should then be collected and arranged to reinforce and explain the text. Reference to the collection and arrangement of illustrative matter will be enlarged upon in another article.

After the marshaling of material, the whole process of the lesson should be thought thru from beginning to end, treating only of essentials. Set these down on scratch paper to form a basis for the formal plan.

Criticise this sketch outline, trying to keep a proper balance between the parts. Do not enlarge unduly upon one phase of the plan to the detriment of the others. Make sure that every part is covered in its entirety.

Finally, draft the complete lesson-plan. Use plenty of paper, and arrange your material so that the plan may be used as notes in conducting the lesson. Some authors suggest the arrangement of the lesson-plan in two parallel columns, one containing comments on the subject-matter, the other the outline of the method to be followed.

Lessons are of many types or kinds. The recitation is exhaustively treated in McMurry, The Method of the Recitation. Read especially the last chapter, XIV, on Lesson Plans.

The Lesson-plan for the average lesson, in which new facts are taught and related to other known facts, has several well marked subdivisions. Thus we have Aim, Teacher's Preparation, Assignment (or Students' Preparation), Presentation, and Work.

1. Under *Aim* state clearly, A, the teacher's aim in planning and teaching the lesson; B, the student's aim, or the motive that appeals to the pupil to impel him to the lesson. Make the aim definite and concrete.

2. *Preparation.* Under this head will be entered all the work that the teacher plans to do in making ready to teach the lesson. This will include:

A. Securing the requisite materials for exercise work. If the system is a large one there will doubtless be a superintendent of supplies upon whom requisitions are drawn. In a smaller system it may be necessary for the teacher to secure his own supplies from local sources. The matter of securing requisite material should be handled sufficiently in advance of the need to insure that no time be lost while waiting for supplies.

B. Making or securing of illustrative material, in the way of charts, models, samples of materials, machines, etc., to illustrate the lesson or some part of it.

C. Placing of outlines or drawings on the board.

D. Other preparations not mentioned above.

Previous to the meeting time of the class, the student-teacher should prepare and collect all material needed to illustrate the lesson, following the listing made in the lesson-plan.

3. *Presentation.* Here enter the activities of the classroom or shop after the class arrives.

A. *The Roll.* The teacher should mark the roll as the pupils take their places, thus saving time. When the last signal sounds, the absentees should be marked. One column in the roll book should be assigned to each hour in the course and the attendance marked accordingly. If you do not understand the current methods of marking attendance and grades, ask the older teachers or principal to explain them to you.

Make out the report of absentees and file in the principal's office at the end of the class period.

B. *Receiving of Assigned Work.* Call for all assigned work. Train the class in an orderly method for collecting such material. Make a note in the plan that certain assigned work is to be called for, to insure that it be not forgotten. Much of the value of assigned work is lost if it is not called for and its delivery insisted upon at the time assigned.

C. *The Assignment.* The assignment is usually made at the beginning of the class period. It may be made near the end of the period, if sufficient time be allowed for the explanation. This is preferable where the assignment depends for its value and for clearness upon facts brought out in the development of the current lesson. Make sure that your assignments have unity; that you do not include parts of two themes.

The assignment may include:

1. The textbook assignment. This will be announced by page and paragraph, giving definitely the extent to be covered. Comment on the content of the assignment; comment on the relation of this work to the work already done; point out the difficulties and how to overcome them; derive formulas that may become stumbling blocks; indicate what to study and how to study it. This is important.

2. Collateral reading: Indicate here any library work or reading in other textbooks intended to clear up obscure points or matters that in your judgment should be given more detailed treatment.

3. Assigned Problems. These should be supplementary to the text. Have them written on the blackboard for rapid copying, or duplicated to hand to the class, so as to lose as little time as possible. Comment on the problems should be limited to indicating into what general classes the problems fall, or to pointing out what formulas will be helpful. Emphasis should be placed on the analysis of the problem; the grouping of the known facts, of the unknown desired facts; the application of known laws or formulas to the known facts to arrive at the desired facts as conclusions or results.

D. *The Recitation.* If the previous lessons included an assignment for textbook study, or collateral reading, it will be necessary, A, to clear up any misconceptions that have arisen; B, to bring out for the whole class the essentials; and C, to test the thoroness of the assimilation of the facts and truths. Demand the attention of all the class all the time, and devise means for insuring such attention.

The recitation is usually one of two general forms: the question-and-answer or Socratic method, and the topical method.

In the question-and-answer method, the teacher asks such questions as will draw out the pupil, reveal his knowledge of the subject, and so group the subject-matter as to indicate essentials and non-essentials, making plain any difficult points.

The Topical method plans to lead the pupil to give out the substance of the book material with a minimum of questioning on the teacher's part. Bagley says this is best developed thru the outline. Require the pupil to stand on his feet and in clear English to discuss the assigned topic or leading question. When a pupil has exhausted his knowledge of the topic, questions as above will serve to bring out and organize the entire substance of the text.

The lesson-plan should indicate the method to be used together with the topics or questions to be employed.

E. *The Demonstration.* If there be any new method of work to be taught, any new tool process or new principle, the demonstration should be employed. Each pupil should be so placed that he has a clear view of the demonstration, without crowding or other distractions. The demonstration should be logical and complete. There is such great variation in subject-matter that it is impossible to give suggestions governing all forms, but in general, the following order will be followed.

1. Demonstrate the connection between practical use and the principle or process to be explained. Where possible this is best done by examples of actual construction or commercial use. If the process to be demonstrated is the making of a drawing board, there should be shown all the various types of drawing board construction, and the advantages of each should be discussed.

2. Demonstrate the likeness and difference between the process or principle and those that have previously been shown.

3. Demonstrate the principle or process itself, step by step, emphasizing essentials, and giving warning of difficult points in technique. Give suggestions of best methods of handling.

F. *Work.* The demonstration should be followed by individual work on a problem or project assigned by the teacher, or chosen by the pupil with the teacher's consent. The teacher's duty here is to give individual instruction and assistance as he passes about among the class at work. If it is found that several pupils are making the same mis-

takes, call them together as a group for demonstration, pointing out their mistakes and the correct method. If the whole class proves to have missed the point of some suggestion do not hesitate to call them to a second demonstration, in which the points in question are emphasized. The lesson-plan should specify the assignment of work for this period.

G. *Dismissal.* When the warning signal sounds, have the room or shop placed in as good order as before the class came in. Insist that no one leave the room till everything is put in place. It may take firmness to accomplish this, but it is imperative that the room be left in good order for the use of the next class. Insist also that the class pass from the room in an orderly manner, not like a herd of cattle. High school boys are especially prone to infringe on good usage in this respect.

After the class has left, the student-teacher should make a quick survey of the room to make sure that everything is in proper order. After he has made the required report at the office of the principal, his duties are complete for that section.

Succeeding sections may duplicate the work of the first class, in which case the teacher has advantage of having tried out a lesson-plan. Usually there are a number of suggestions for bettering the lesson-plan which may be noted during the progress of the first lesson. These should be incorporated in the plan the second time it is used.

The written plan including all corrections and suggestions should be very carefully preserved by the teacher to the end that he have a record of his work and a source to which he may go when a similar lesson is taught in the future.

HAND BAGS DESIGNED AND MADE BY FOURTH GRADE GIRLS IN THE GIRLS' HANDICRAFT DEPARTMENT, DENVER, COLO. MISS IDABELLE McGLAUFLIN, SUPERVISOR.

These bags, of which twenty were made by as many girls, were intended as Christmas gifts. The Christmas decorations, which were worked out in cross-stitch in thread of two colors, appealed strongly. One child visualized festoons of greens interspersed with bunches of mistletoe; another saw visions of baskets of holly; and still another, in whose imagination the Christmas dinner loomed large, saw the five-armed candle stick; another could think of nothing so satisfying as the Christmas tree. The bags are the result of purposeful teaching of design.

PRIMARY CONSTRUCTION

Edward F. Worst, Director of Elementary Manual Training and Construction Work, Chicago

IT might be well to suggest to those specially interested in the primary construction work that reference will be made from time to time to problems described in previous numbers of the magazine. The plan is to make the work systematic.

Every up-to-date teacher must realize the importance of hand work. The time for the hit and miss construction work has passed and the demand comes from the teachers for the more practical and related problems for the primary grades. It will be observed that the seasons of the year have somewhat to do with the planning of the right sort of problems. The writer urges that the teacher perform the various operations described in order that she may adapt and present the work to the pupils in her own way.

OCTOBER

CONSTRUCTION WORK FOR FIRST GRADE.

CUTTING.

Continue cutting from memory and imagination, relating this phase of the work to the English and Story.

CUTTING TO LINE.

Jack-o-lanterns, cats, witches, bats, and other cuttings relating to Hallowe'en.

Purpose:

To teach the pupils that cutting is a mode of expression, and that each cutting tells a story.

To make cuttings for schoolroom decoration for the month of October.

To develop the imagination.

To train the hand, eye, and brain to work in unison.

CLAY.

Use the composition clay freely. Encourage pupils to work with one piece. For example: If the pupil wishes to model a horse, begin with a piece of clay large enough to make the whole animal, the head, legs and tail being drawn from the original piece. So often small pieces are taken from the large piece, rolled into cylinders, and stuck onto the body for legs. If the pupils are permitted to work in this way, it leads to bad habits which make trouble in the upper grades when handles or feet are to be added to various pottery forms.

BOX FOR PICTURE NUMBER CARDS.

Purpose:

To make number concrete.

To provide a way for counting and associating the symbol with the number for which it stands.

Material:

One hundred 6″ squares of construction paper.

Library paste.

Presentation:

An informal talk should precede the construction of the box. The pupils have the cards before them. Should the box be large? Why? Should it be very small? Why? Show, by using your hands, how long the box ought to be. How wide should it be? How deep?

As this is only the second box the pupils have constructed, the teacher should review very carefully the number work developed in the construction of the first box, adding just a few new points.

Pass to each pupil a 6″ square. Call attention to the edges. How many? Are the edges all the same length? How many corners has the square?

Fold the right and left edges together. What shape is the paper? (Oblong.) How many edges has it?

Lead the pupils to see that the oblong has two long edges and two short edges.

The edges of the square are equal in length.

Unfold. How many oblongs in the square? Each oblong is what part of the square? Fold the right and left edges in to center crease. Unfold. Into how many parts is the paper now divided? It is just a little too early to develop fourths.

Hold the paper so the creases run from right to left.

Fold right and left edges together. How many rectangles are there on one side? Unfold. How many rectangles altogether? How many rectangles in one row? How many in two rows? Fold the right edge into center crease. How many squares may be seen?

Unfold. How many squares may now be seen?

How many squares in one row?

How many squares in two rows?

How many more squares in the right half than rectangles in the left half?

Fold the left edges in to center crease. Unfold.

How many rows of squares are there?

How many squares in one row. In two rows? In three rows? In four rows?

To finish the box, cut away one row of four squares. How many squares are left?

Proceed to finish the box as suggested in box for shoe pegs in the outline for September, remembering to cut, freehand, from two edges of the square from which the box is to be constructed, narrow strips not more than one-quarter inch wide. The square used in the construction of the cover remains the full 6″ square.

Hektograph pictures in groups and the figures corresponding to the number of objects in the group beside it. These cards may be had in the market already prepared at a very small cost. Cut the sheet into separate cards, leaving the number attached to the group. See Fig. 1.

In the first lesson, allow the pupils to match the one with one, two with two, etc.

Cut apart, leaving the pictures on the one card and the figure on another.

Lay on the desk, matching the figure with the group for which it stands.

The figures may be used by laying sticks or other counting material in groups containing the same number as those on the cards.

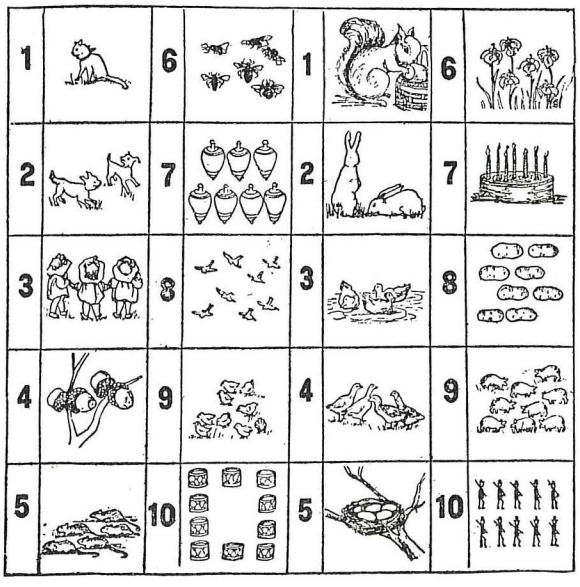
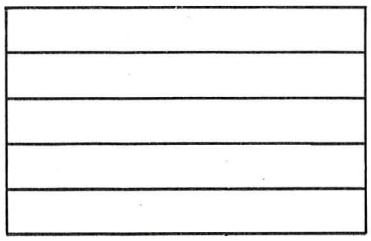


Fig. 1.



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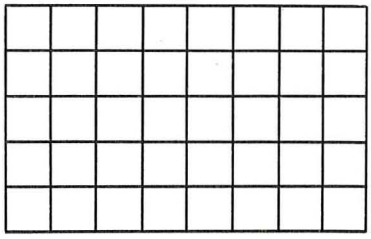

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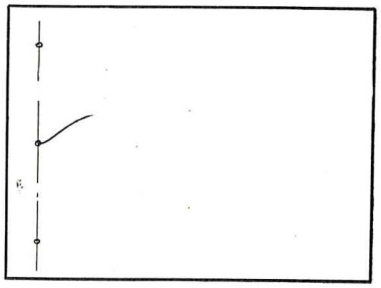

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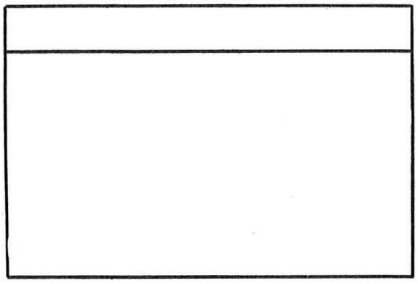

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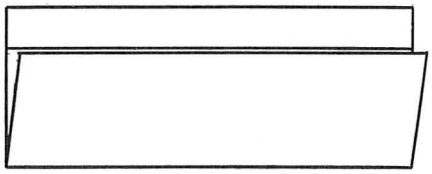

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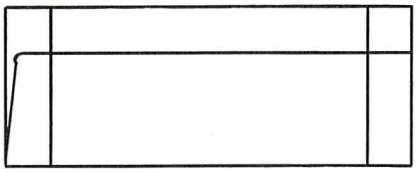

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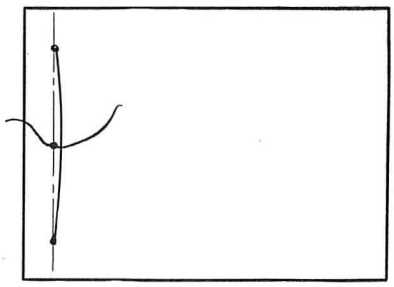
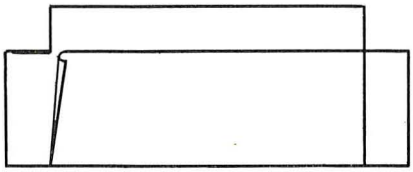


Fig 10a



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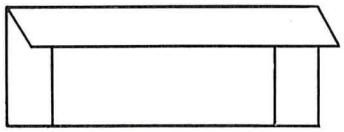


Fig 8

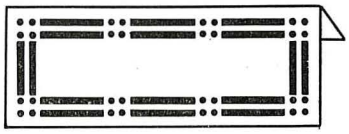


Fig 8a

First Grade Problems.

Sticks may be laid to show a different combination in each group.

Two combinations can be made for 4: 2 and 2; 3 and 1.

Four combinations can be made for 8: 7 and 1; 6 and 2; 5 and 3; 4 and 4.

THE RULER AS A STRAIGHT EDGE.

PEG BOARD.

Purpose:

To begin to use the ruler as a straight edge.

To teach neatness.

Material:

One sheet of construction paper, 8″x5″.

Tools:

Ruler and pencil.

Presentation:

Provide each child with a piece of drawing paper 7″x5″. Place the ruler so one long edge coincides with one long edge of the paper, and draw a line along the opposite edge of the ruler. Remove the ruler and place one long edge so it coincides with the line just drawn, and draw along opposite edge. Continue in this way until the opposite edge of paper is reached. (Fig. 2.)

Turn the paper and place the ruler so one long edge coincides with one short edge of the paper, and draw a line along the opposite edge of ruler. Remove ruler and place so one long edge coincides with line just drawn, and draw along opposite edge of ruler. Continue in this way until lower edge of paper is reached. (Fig. 3.)

This divides the paper 7″x5″ into squares. It will be observed that nothing has been said about inches.

A few questions like the following will aid the pupils in their counting:

How many squares in the first row along the short edge?

How many squares in two rows along the short edge?

How many squares in the first row along the long edge?

How many squares in one long row and one short row?

How many squares half way around the paper?

USE OF BOARD.

With the board and pegs on each child's desk, have the pupils place two yellow pegs in each square in the top row.

Place three blue pegs in each square in the second row.

Place four red pegs in each square in the third row.

This may be varied in many different ways.

ENVELOPE FOR PEG BOARD.

Purpose: To hold the peg board.

To teach order and system in making a place for everything, and by having everything in its place.

To use the ruler as a straight edge.

Material: 9″x12″ tinted construction paper and paste.

Tools: Scissors and ruler.

In the construction of previous envelopes, no provision was made to have the paste flap a part of the original piece of paper. Extra strips were cut and pasted over edges.

The new step in the present construction is the planning for the paste flap. Allow the pupils to suggest a way in which this might be done.

To Construct the Envelope:

Pass to each pupil a piece of 9″x12″ construction paper. Place the ruler along one short edge of the paper, and draw a line as far from the edge as the ruler is wide. Fig. 4. Fold the opposite edge of the paper to the line just drawn. Fig. 5.

Instead of closing edges by pasting extra strips, as in cutting envelope, place the ruler so one long edge coincides with one open edge of the envelope, and draw a line along the opposite edge of the ruler. Fig. 6. Cut along the line just drawn, being careful to cut only the top part of the envelope and the corner out of the flap, as shown in Fig. 7. The under side of the envelope now extends beyond the upper side. Fig. 7. Place the ruler along opposite edge of envelope, drawing and cutting.

Paste is applied to the flaps and creased over on to the upper side of envelope, as shown in Fig. 8. Cut away a small triangle from lower edge of flap as shown in Fig. 8. This gives the envelope a neater appearance.

ENVELOPE FOR MATCHING NUMBER GAME.

Purpose:

To review the construction of the envelope given in September.

To provide an opportunity for the pupils to recognize the same number in other forms.

To aid in the caring for seat work.

Material: 6″x9″ construction paper.

Tools: Scissors and ruler.

Presentation:

Review the construction of the envelope made for the peg board and then pass to the pupils 6″x9″ pieces of contruction paper, asking them to construct envelopes for the matching number cards.

THE GAME.

Fig. 9 shows a matching number card, such as should be provided for each pupil of the room. These may be made by the teacher or purchased. This gives to each pupil 60 small cards when cut apart. In order that the pupils may readily understand the game, it would be well for the teacher to make one large set, making each card about 4″x8″. These large cards are passed, one to each pupil.

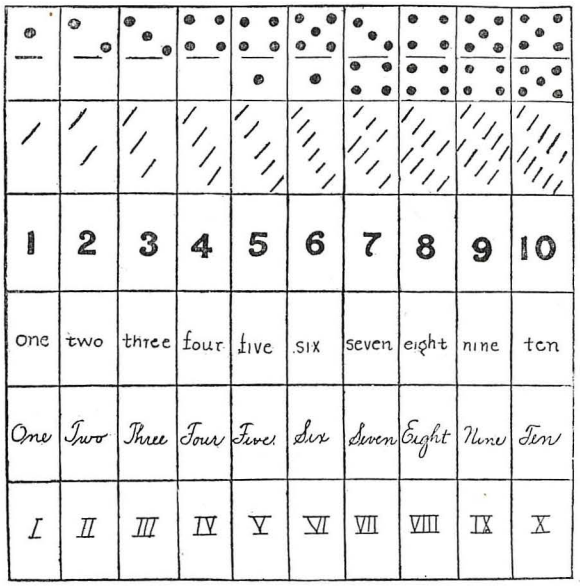


Fig. 9.

A child stands before the class and shows his card. All children who have the same number in other forms, come to the front and stand beside the first child and show their cards to the class. When the pupils understand the game, the small set, which is provided for each child, is cut and placed in the envelope. These may be used very profitably for a number of seat work periods. The game is played by each child with the small cards in the same way as the whole room played the game with the large cards Find "one" in any form and place it at the top of the desk and then find "one" in every other form and place beside it.

CUTTING BOOK.

Purpose:

To provide a place for best cuttings which have been kept to date in the cutting envelope.

To give pupils an idea of the construction of a very elementary book.

Material:

9″x12″ manila drawing paper.

Tinted construction paper.

Eyelets.

Macrame twine.

Presentation:

Much enthusiasm for the construction of the book has already been created by the teacher talking about the cuttings. The pupils have the desire to preserve the best cuttings. The real necessity for the book has already been created.

It will be necessary for the teacher or several of the older pupils to punch the holes in the leaves and covers of the book. This is not so great a task, as all the leaves and covers for a book may be punched at one time.

Place the eight leaves and the two colored pieces of tinted construction paper in a pile. Punch the pack at the center of the back along one short edge about one-half or three-quarters of an inch from edge. About three and one-half inches above and below this hole, punch others.

The eyelets are placed in the tinted covers only. The combination eyelet punch and set will do the work.

Cut the macrame twine into pieces twenty inches long.

Allow each pupil to tie his own pages together. Pull the twine thru the center hole first. Draw all but about $2\frac{1}{2}$ or 3 inches thru the hole. If all the leaves cannot be held at one time, place the twine thru a part at a time until all have been strung.

Bring the twine from the under side up thru the hole which is above the center. The end is then brought thru the hole below the center. This makes a long stitch from the upper to the lower hole. Allow the end now to come up thru the center. There are now two ends, one at each side of the long stitch. Fig. 10.

With these two ends, tie a hard knot over the long stitch. This completes the book, and it is ready to receive the cuttings. The mounting will occupy several periods of construction work.

CLAY BOX.

Purpose:

To introduce an opportunity of meeting a new condition.

To aid in keeping number concrete.

To continue to use the work as a basis for oral language.

Material:

9″ squares of construction paper.

Pieces of manila paper, one-half cut to fit the bottom of the boxes, and the other the tops of the covers.

Library paste.

Tools: Ruler and scissors.

Presentation:

In the construction of previous boxes, it was not necessary to consider a double thickness for the bottom of the box and for the top of the cover. On account of the oily condition of the clay it is necessary to consider even more than a double thickness; but in addition, an extra piece of paper (manila document) is placed between the two sheets forming the bottom of box and top of cover.

Talk over with the class in an informal way the new conditions to be met in the construction of the clay box. Should the box be larger than any of those already constructed? Should it be stronger? Why? Why is it necessary to have the bottom thicker than in the other boxes?

To construct the Box:

From the 9″x12″ pieces of construction paper, cut 9″ squares. From two edges of the squares used for the box construction, cut a narrow strip, free hand, not more than a quarter of an inch wide. This makes the box, when finished, just a trifle smaller than the cover.

Fold the square into sixteen small squares, emphasizing the number in the process of folding.

Cut squares from two corners, as shown in Fig. 11. Cut on continuous lines.

To fold into box form, fold the edge "a, b" to meet "c, d," and crease well. This is done the same as in previous exercises.

Next, fold "e, f" so it meets "g, h." In doing this, the rectangle "i" is carried with it, and fits over the bottom of the box "j."

The remainder of the box construction is the same as in previous box constructions.

With the paper cutter, cut small rectangles of manila document paper, and lay between the two parts of the bottom. Use paste to keep the various parts together.

Construction of Cover:

Fold the same as in construction of box, but do not cut narrow strips from original square, as the cover should be a trifle larger to provide for easy removal.

Place a rectangular piece of manila document paper on top of cover, as suggested in the box.

LANTERNS.

Purpose:

To decorate the schoolroom for Hallowe'en.

To give freedom in use of scissors.

To give pupils choice of colors.

To use the ruler as a straight edge.

Material:

6″x9″ tinted construction paper.

Library paste.

Tools: Ruler and scissors.

Presentation:

The cutting to line and the imaginative cuttings are to be used in schoolroom decoration. To add to the decorative interest, the lantern may be introduced, asking the pupils to suggest the size, color, construction, and where they may be hung.

A simple lantern for decorative purposes may be constructed as follows:

Place a 6″x9″ piece of construction paper on the desk so the long edges are parallel with the front edge of the desk. Place the ruler along each long edge, and draw lines as far from the edges as the ruler is wide. Fig. 12. A half-inch strip of cardboard may be used instead of the ruler.

Fold the long edges together. Fig. 13.

With the scissors, cut thru the closed edge along the dotted lines shown in Fig. 14, to the lead pencil line. The pupils are not to draw the dotted lines to guide them, but to cut free hand, judging the distance. These strips are about one-quarter inch wide. Cut away the last strip, as shown by the continuous line in Fig. 14.

Unfold the paper. Put paste on the extended bands, and paste top and bottom in to circle. Fig. 15. With a string, or paper handle, these lanterns of various colors make very pretty decoration for a primary room.

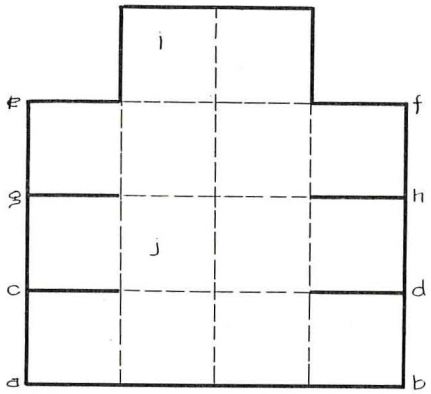


Fig 11

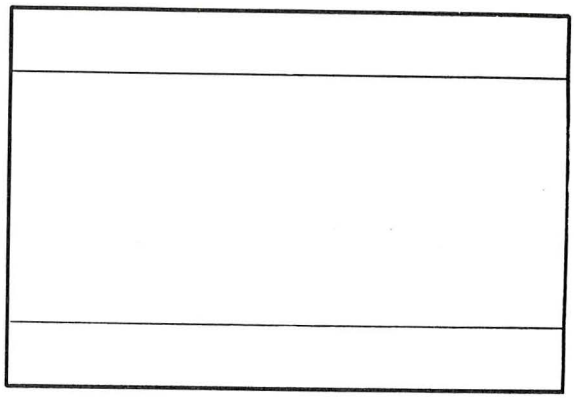


Fig 12

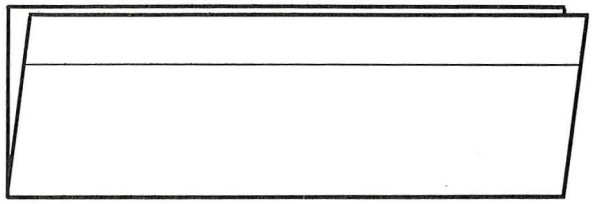


Fig 13

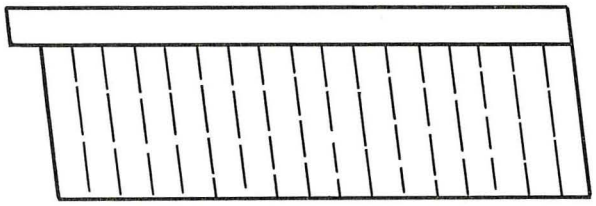


Fig 14

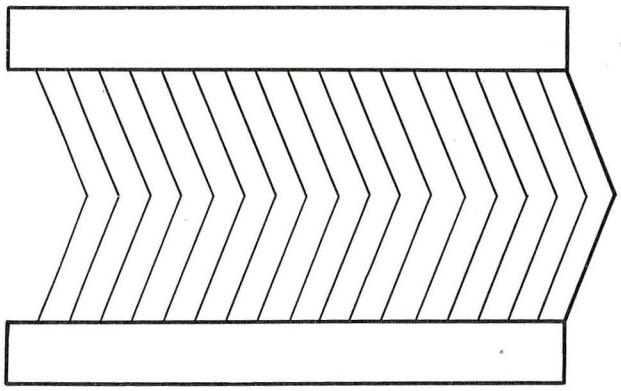


Fig. 15

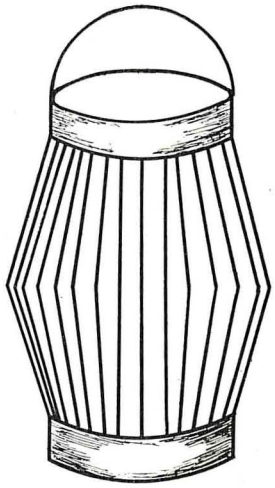


Fig. 16

By this time a quantity of small pieces of paper has accumulated.

Pass pieces of various sizes and colors to pupils as they finish the regular problem, asking them to construct other problems without direction.

ALPHABET BOOK.

Purpose:

To familiarize the child with the alphabet.

To plan for systematic cutting and pasting.

Material:

9″x12″ manila drawing paper.

Tinted construction paper.

First Grade Problems.

Carpet warp, macrame twine, candle wicking or jute for tying.

Coarse darning needles (may be borrowed from some other grade).

Sheets of small and capital alphabet.

8″x10″ Kraft wrapping paper for the cuttings.

Presentation:

Before beginning the construction of any problem with the class, the teacher should have a finished exercise that she did. She thus becomes familiar with any little difficulty that might arise with the child. It also makes her more appreciative of the child's efforts. With a finished book to show the pupils, the construction may begin.

Construction of Book:

Fold each sheet of drawing paper into halves by bringing the short edges together.

Place one sheet within the other, the tinted sheet on the outside of all.

With the darning needle, make a hole on the crease down the center, about two inches from the top, and another about two inches from the bottom.

With the needle threaded, bring it from the outside thru the hole at the top and then from the inside thru the hole near the bottom. With the two ends on the outside, tie a hard knot and then a bow knot.

How to Use Book:

Each pupil is provided with the alphabet in both small and capital letters.

Cut on the dividing lines. On the first page of the book paste a small "a" and a capital "A," one in the upper right hand corner and the other in the upper left hand corner. Leave a suitable margin.

From the kraft wrapping paper, cut or tear something that begins with "a."

On the second page place the letter "b," cutting something that begins with "b," and paste. In this way take each letter of the alphabet. Fig. 16.

It will take some time to complete the problem, but there is some satisfaction in the finished product, because each child's efforts have been placed in permanent form.

OCTOBER.

CONSTRUCTION WORK FOR SECOND GRADE.

CUTTING AND TEARING.

Free-hand, covering the imaginative and memory cuttings.

Relate the cutting to the history, literature, civics and special holidays. Most of the cutting in the first grade is one-piece cutting. In the second grade, parts of simple illustrations may be cut and assembled. For example, if, in the illustration there is to be a house, tree, and a man, each may be cut separately, arranged and pasted. This gives opportunity for freedom which the drawing does not, as it is possible for the pupil to change the arrangement until it is what he desires, before making it permanently by pasting. Cut cats, witches, pumpkins, etc., for Hallowe'en decorations.

Purpose:

To give freedom and originality.

To train the hand, eye, and brain.

To give an opportunity to use cutting as a mode of expression.

THE HALF INCH.

Some time should be spent in developing the half inch. During the month of September, the work was confined to the inch.

Permit the pupils to measure objects in the room.

Pass to each child a 6″x9″ piece of paper, allowing him to measure off the entire piece into half-inch squares. This may be done by placing dots one-half inch apart along the long edge and then connecting corresponding dots. Treat the short edges in a similar way. Cut along the lines, using the small squares to arrange in borders.

CUTTING BOOK.

Purpose:

To provide a place for the pupil's best cuttings.

To give experience in simple book making.

Material:

3 pks. (100 sheets) of 6″x9″ tinted construction or manila drawing paper.

1 ball of macrame cord.

1 pk. of 6″x9″ tinted construction paper.

Presentation:

The pupil's cutting envelope is the first step toward the construction of the cutting book. His desire to care for his best cuttings will lead to interest in putting forth his best efforts in the construction of the book.

Construction of Book:

Pass to each child six pieces of paper 6″x9″. To give practice in half-inch measuring, draw a line on each sheet ½ inch from one of the short edges. On each line place a dot at center and other dots 2 inches above and below the one just placed. These dots will mark the places the sheets should be punched. (Fig. 1.) The first page and the last page of the book make the cover, and should be of another color than the other pages.

To Tie the Pages:

Allow the macrame cord to pass thru the center hole of each sheet. Bring one end of the cord thru the hole below the center. Bring the same end down to the hole above the center, back and thru the center hole. Both ends are now thru the center hole, one at one side of the long stitch and the other at the other side. With the two ends tie a hard knot. The book is now ready to receive cuttings. (See cutting book for first grade, October.)

LANTERN.

Construct small lanterns of different colors and sizes.

Purpose:

To be used in schoolroom decorations.

To give the pupils an opportunity to construct rectangles.

To give a practical lesson in perimeter and circumference.

Material: 1 rectangle 6″x3″.

1 rectangle 6″x5″.

These rectangles may be made of one pack of 6″x9″ construction paper.

Library paste.

Tools: Scissors and ruler.

Presentation:

Show the pupils a completed lantern. They are always interested in schoolroom decoration—so much so that the enthusiasm and interest need not be created, because they are already there.

Pass to each pupil a piece of 6″x9″ tinted construction paper. He is to measure and cut from this piece two rectangles, one 6″x3″ (Fig. 2), and the other 6″x5″. (Fig. 3.)

Place the dimensions of the above on the blackboard, and permit the pupils to begin work without any further direction. Impress upon the pupils to use the materials as economically as possible.

After the rectangles are drawn, ask the class a few questions similar to the following:

What is the length of the two short edges put together?

What is the length of the two long edges put together?

Draw a line equal in length to one long edge and one short edge put together.

How many inches half way around the rectangle?

How many inches around the rectangle? (Introduce perimeter.)

Allow the short edges of the 6″x3″ rectangles to overlap one-half inch and paste. (Fig. 4.)

How does the circumference of the cylinder compare in length with the long edge of the rectangle?

In the 6″x5″ rectangle, draw lines one-half inch from long edges and parallel to same.

Fold long edges together and draw lines ½ inch apart from the closed edge to the line above. (Fig. 5.) While the paper is folded, cut along the continuous lines just drawn.

Cut away the last strip, as shown in Fig. 5. If narrower strips are desired, cut each strip in center, free-hand, making them ¼ inch wide.

Unfold, and paste the slashed rectangle around the cylinder. (Fig. 4.) This completes the lantern. (Fig. 6.) Add a string or paper hanger.

By this time a quantity of small pieces of tinted paper has accumulated. Pass this around to the pupils, allowing them to construct other lanterns.

DOUBLE WEAVING: *Book Mark.*

Purpose:

To give the child an experience in simple double weaving.

To train the hand, eye and brain to work in unison.

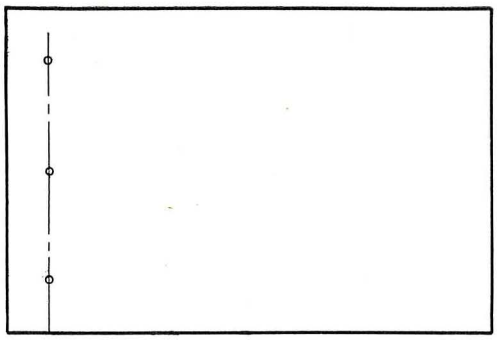
To give the child the power to work out what he wishes to use in his play.

To prepare for the more advanced basketry in upper grades.

Material:

100 strips 12 inches long and ½ inch wide.

300 strips 6 inches long and ½ inch wide.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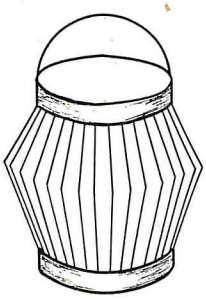
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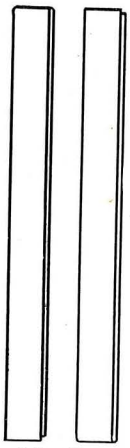
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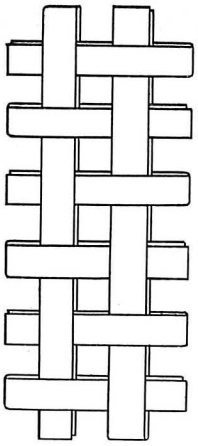
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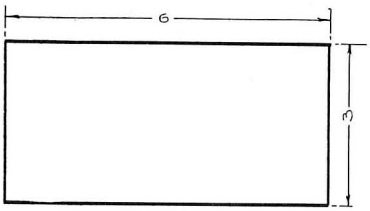

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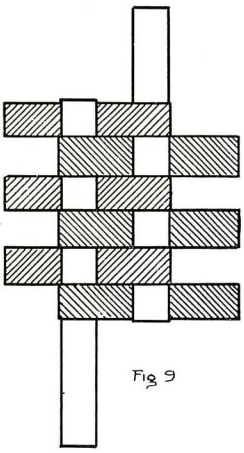
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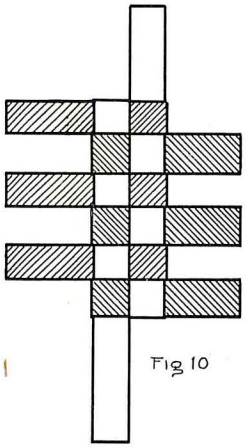
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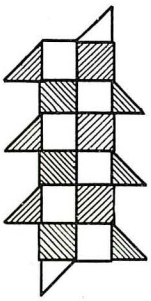


Fig 11

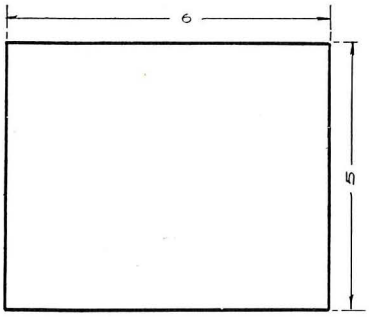
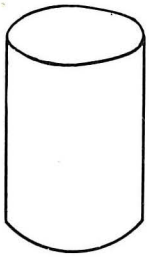


Fig 3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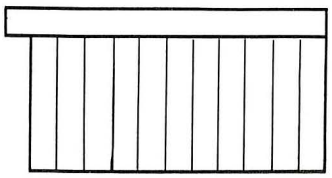
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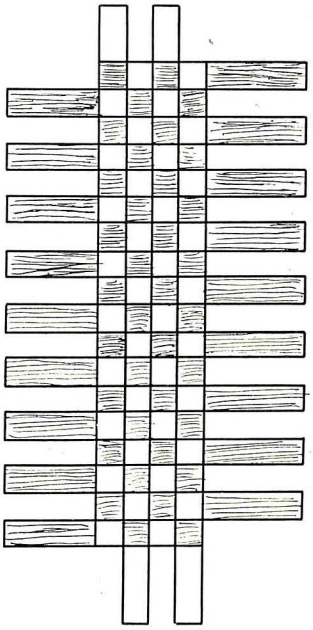
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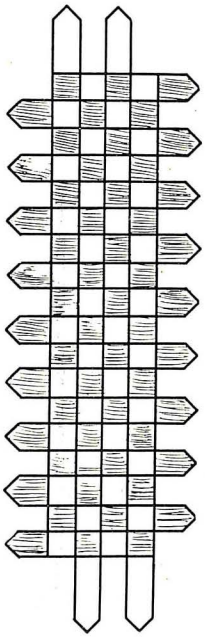


Fig 13

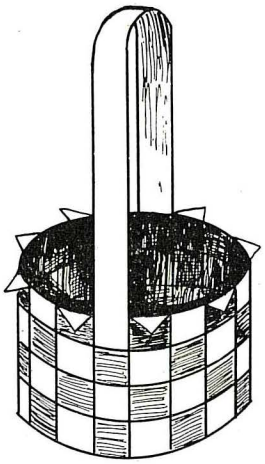


Fig 14

Second Grade Problems.

Presentation:

Show the pupils a completed book mark. Begin the book mark by using two contrasting shades of bogus bristol board. Cut two strips 12 inches long and $\frac{1}{2}$ inch wide from one shade. Fold the ends of each strip together. Cut six strips, each 6″ long and $\frac{1}{2}$″ wide from the other shade. Fold the ends together.

Arrange the two long strips in a vertical position, the one on the left having its *folded edge* toward you, and the second one having its two *ends* toward you. (Fig. 7.) Begin weaving with the short strips, an inch from the back left corner. (Fig. 8.)

Open the ends of the weaver and pass one above and one below the two parts of the first vertical strip. Close the ends of the weaver and pass them between the two parts of the second vertical strip. (Fig. 8.)

Begin with the second weaver at the right edge. Open the ends of the weaver and pass one above and one below the two

parts of the first vertical strip. Close the ends of the weaver and pass them between the two parts of the second vertical strip.

Continue weaving in this manner, first from the left side, then from the right side, until the six weavers have been used. By pulling the open ends of the vertical strips, the weavers are pressed together as shown in Fig. 9. By pulling the open ends of the weavers, the vertical strips are pressed together. (Fig. 10.)

Fig. 11 shows the finished book mark.

CIRCULAR BASKET.

Purpose:

To be used in Hallowe'en party.

May be useful for a button box in the home.

Leads to skill in the manipulation of material.

Material:

200 strips 24 inches by $\frac{1}{2}$ inch of one color.

400 strips 12 inches long by $\frac{1}{2}$ inch of a contrasting color.

100 four-inch squares of bristol board.

Construction of Basket:

When more than two vertical strips are used, as in the circular basket (Fig. 3), arrange the four long strips in a vertical position, the first one on the left having its *folded edge* toward you, the second one having its two *ends* toward you, the third one having its *folded edge* toward you, and the fourth one havings its two *ends* toward you. Fig. 12 shows the weaving of the circular basket.

After the weaving is completed, cut the vertical and horizontal strips pointed, as shown in Fig. 13.

Form the basket by bringing the ends of the vertical strips cut pointed, together. Pass each end under the first weaver on the opposite edge. This makes a secure fastening.

Form the bottom of the basket by folding inward the ends of the weavers. Cut two circular pieces of paper of the desired size; paste one circle on the inside and the other on the outside. Fold the points outward around the top. Fig. 14 shows the finished basket.

The forming of the basket is not a difficult process, as the strips are woven across on the outside.

OCTOBER.

CONSTRUCTION WORK FOR THIRD GRADE.

CUTTING.

Cutting from memory and imagination, as it relates to the academic work.

Cutting in parts and then assembling may be very successfully and effectively carried on in the third grade.

A small amount of cutting from objects may be introduced in this grade.

Cutting of cats, bats, witches, and pumpkins for Hallowe'en decorations.

Cuttings to decorate lanterns.

Purpose:

To cultivate the imagination.

To work for skill in a combination of hand, eye, and brain exercises.

To encourage originality.

To use cutting as a mode of expression.

LANTERN.

If the teacher so desires, pupils of the third grade, in addition to the lantern planned, may construct lanterns similar to those constructed in the first and second grades, measuring each part necessary for their construction. If this is done, pupils should work without direction. Lanterns of the lower grades may be shown the pupils, allowing them to get what they can from observation. Pass the necessary material and let them construct.

Purpose:

To create a desire in the pupils to do good work thru their interest in a pleasing exercise to be used in schoolroom decoration.

To give opportunity to combine colors.

To make number work practical thru construction.

Material: Tinted construction paper 9″x12″.

Tools: Ruler and scissors.

Presentation:

Third grade pupils have not outgrown the desire to decorate the schoolroom for special days.

Present to the class a finished lantern constructed by the teacher.

Pass to each pupil a sheet of 9″x12″ tinted construction paper. It requires a rectangle of $9\frac{1}{2}$″x$4\frac{1}{2}$″ to construct the lantern.

Place the drawing (Fig. 1) on the blackboard and permit the pupils, after a few questions like the following, to begin work without further direction:

How long is the piece of paper on the desk? How wide?

What is the length of the drawing of the lantern? How wide?

From what part of the sheet should the lantern be cut?

Teach the pupils to use materials economically as possible.

The rectangle required may be cut from one corner of the sheet of paper, as shown in Fig. 2, leaving a strip $2\frac{1}{2}$″ wide at the end of the sheet.

After cutting the $4\frac{1}{2}$″x$9\frac{1}{2}$″ rectangle from the sheet, have each pupil exchange the remainder of his sheet with some other pupil having another tint of the same color, or a harmonious contrasting color.

From this piece cut two strips $\frac{1}{4}$″x12″, and use as decorative bands pasted around the lantern about $\frac{3}{4}$″ from upper and lower edges. (Fig. 3, 4, 5, 6.) The end piece may be used for other simple decoration.

The decoration applied to Fig. 3 is largely governed by the time of the year the lantern is constructed. If in October, the Jack-o-lantern will do; if in November, the Mayflower; and if in December, the pine tree.

Very interesting conventional designs may be made by using the stick printing. Small sticks, circular, square, rectangular and triangular may be used as a block print.

WORD BOOK.

Purpose:

To have the pupils become familiar, so far as they are able to comprehend, with simple book making.

To submerge construction, drawing, and numbers to one subject—construction.

To construct that for which there is an immediate need.

To lead the pupils into systematic way of keeping new words.

Material:

Jute board 6″x$4\frac{5}{8}$″.

9″x12″ white unruled language paper, or tinted construction paper.

Construction paper 6″x$4\frac{5}{8}$″.

Bookbinder's cloth, 6″x$2\frac{1}{2}$″.

Needles.

Super, 1″x5″.

Linen thread.

Presentation:

By the time pupils reach the third grade, they are capable of fully appreciating some systematic way of keeping lists of new words. The way for the construction of a word book has been well paved. Some of the points the teacher and the class should discuss before beginning to construct are as follows:

The arrangement of the work on a page.

How many columns?

The size of the pages.

How shall words be arranged regarding initial letters?

What are some of the advantages of arranging the words alphabetically?

How may the pages be indexed so certain words may easily be found?

What colors would be good for the outside cover? Why?

Having decided upon the above, the class is ready to begin the construction of the book.

Construction: First Lesson.

Each child is provided with two pieces of jute board 6″x $4\frac{5}{8}$″, and a strip of bookbinder's cloth 6″x3″. Draw a dotted line thru the center of the bookbinder's cloth vertically. This will necessitate finding $\frac{1}{2}$ of 3″.

At each side draw two continuous lines parallel with the dotted line just drawn, and $\frac{1}{8}$″ from it. (Fig. 7.) This rules off a quarter-inch strip thru the center of the bookbinder's cloth.

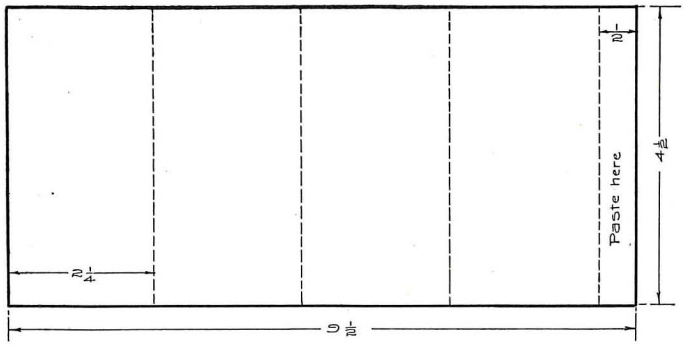
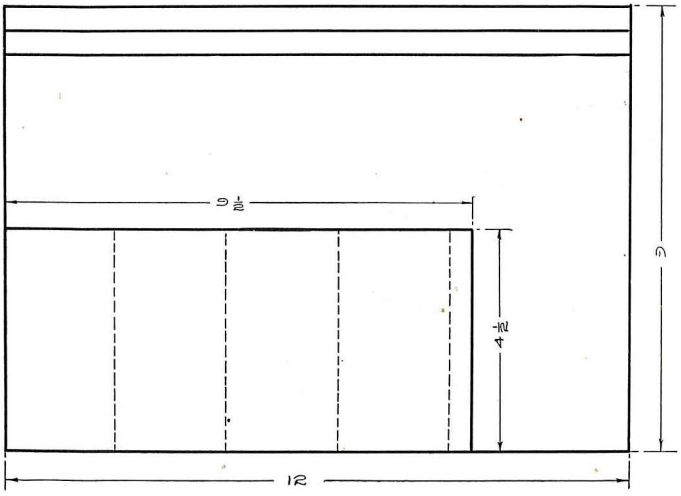


Fig. 1



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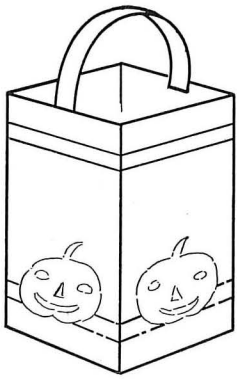


Fig 3

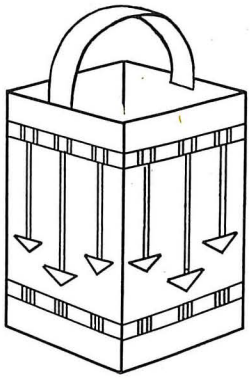
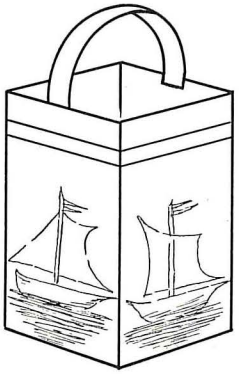


Fig 4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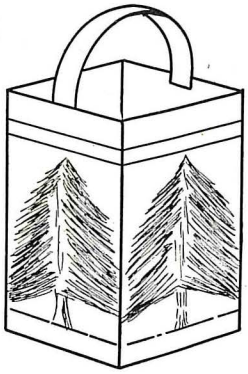
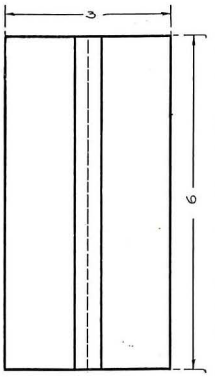


Fig. 6



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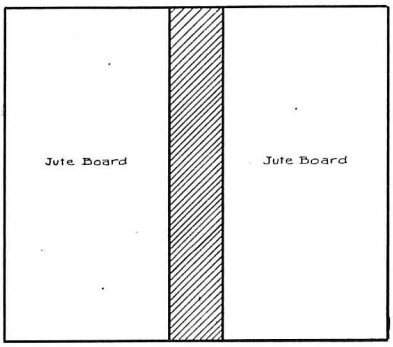


Fig 8

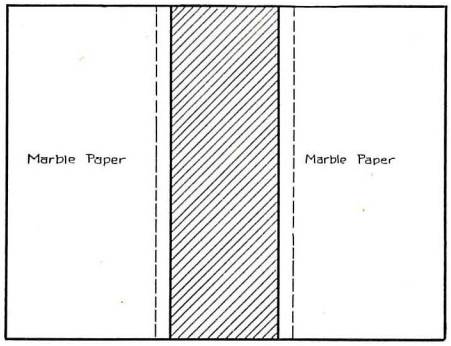


Fig 9

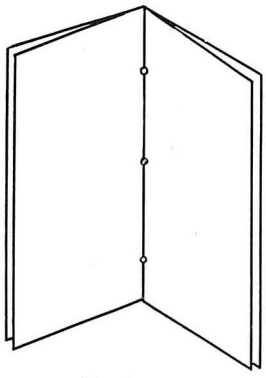


Fig 10

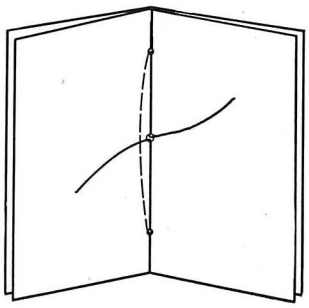


Fig 11

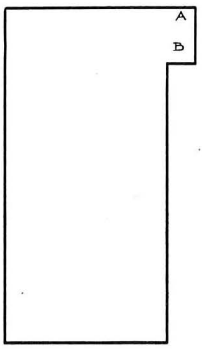


Fig 12

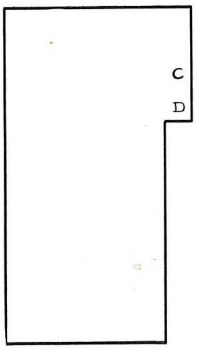


Fig 13

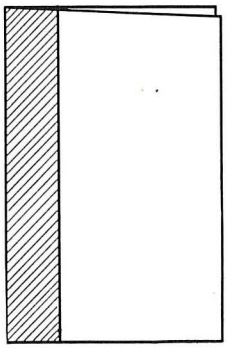


Fig 14

Third Grade Problems.

To avoid measuring in eighths of an inch, provide each pupil with a quarter-inch strip of paper which may be placed down the center of the bookbinder's cloth, and a lead pencil line drawn along each edge. What is wanted is a $\frac{1}{4}''$ space down the center of the cloth.

Apply paste to the entire strip and lay the jute board covers on the strip so the edges just meet the lead pencil lines, leaving $\frac{1}{4}''$ between the covers. (Fig. 8.)

Before beginning to paste, encourage the pupils to bring in newspapers. These may be torn in such a way that the pupils always have clean pieces of paper on which to paste.

After smoothing the pasted bookbinder's cloth, the covers are ready to be put into the book press.

Place a small strip of oiled paper down the center of each cover to prevent the one on top from sticking to the one below.

Second Lesson:

The bookbinder's cloth is now dry, and the covers may be handled without danger of pulling apart.

From the marble or tinted construction paper, cut two pieces each $3\frac{1}{2}''$x6$''$. Apply paste to the paper, and place upon the jute board covers, allowing the paper to overlap from $\frac{1}{8}''$ to $\frac{1}{4}''$ of the bookbinder's cloth down the back. Fig. 9. (The dotted lines show the part of the binder's cloth under the paper.)

The cover paper may extend beyond the edges of the jute board covers. This surplus may be trimmed off after the paste has dried.

The book is now ready to be put into the press for a second time.

Third Lesson:

In this lesson the white sheets should be folded into quarters. Fold first the short edges together. Fold again the open edges together. Each sheet now measures $4\frac{1}{2}''$x6$''$.

Fold each of the four white sheets in the same way. After the sheet is folded it is called a section. Place sections one within the other, and with the linen thread, sew together in the manner shown in Fig. 10 and as follows:

Place a dot at the center of the crease at back. Two inches above and below this center dot place other dots. (Fig. 10.) Before beginning to sew, thrust the needle thru the sheets at each dot.

Apply paste to strip of super and paste down the back of white sheets.

Thread the needle with the linen thread and thrust it thru the center hole from inside of sheet. Draw all but about two inches of the thread to the outside. (Fig. 11.)

Thrust the needle from the outside thru the hole above the center, and draw the thread to the inside. Next, thrust the needle from the inside thru the hole below the center hole to the outside. This makes a long stitch down the center of the back (shown by dotted line). (Fig. 11.)

The needle is now on the outside. (Fig. 11.) The needle is now thrust thru the center hole from the outside, coming thru in such a way as to leave the first end at one side of the long stitch, and the needle and remainder of thread at the other side of the long stitch. With the first end and the thread in the needle, tie a hard knot over the long stitch. Cut thread, leaving ends about $\frac{1}{4}''$ long.

Do not delay the construction of this book if there is no super, as the book may be made without it. Super adds some to the strength of the book, as a strip 1$''$x5$''$ may be pasted down the back before placing the book into the covers.

Fourth Lesson:

The book covers may now be removed from the press, and the leaves may be placed in the covers. The first and last pages of the book become the linings.

Slip a piece of newspaper under the first page, and apply paste to the page. The newspaper prevents paste from getting on the under pages.

Place the book within the covers, forcing it well to the back. Lay cover on pasted page. Slip a piece of newspaper under last page of book and paste same as the first. The book is now pasted within the covers. Books are now placed in the press, being careful to use some means of preventing the covers from sticking to each other. Slip several thicknesses of newspaper under the inside of each cover to prevent the pages of the book from absorbing moisture from the paste.

It will be found that the edges are rather irregular, and need to be trimmed. This is best done in a large paper cutter such as may be found in many of the schools, or in a printing office. If it is not possible to have the books trimmed by machine, allow each pupil to trim his own.

Fifth Lesson:

If the teacher so desires the book may now be indexed. Allow one page for two letters. The pages are now 6$''$ long. Cut from the outer edge of the first page a strip $\frac{1}{2}''$ wide and 5$''$ long. This allows one inch to remain. (Fig. 12.) On this 1$''$ the letters "a" and "b" may be placed. From your second page, and along the outer edge, cut a strip $\frac{1}{2}''$ wide and 4$''$ long; and on this remaining strip place the letters "c" and "d" in such a way that they are just below "a" and "b" on the first page. (Fig. 13.)

From the next page cut a strip $\frac{1}{2}''$ wide and 3$''$ long, placing on this page "e" and "f," just below "c" and "d." Continue in this way until the last page is reached.

Fig. 14 shows outside of the completed book before applying the design.

The word book should be a great aid to both teacher and pupils. With the indexed book at hand, it is possible for the pupils to readily find the spelling of words whenever necessary, without interrupting the teacher, thus making better spellers.

It may often be used as a basis for a language lesson, asking the pupils to use the words on a certain page in sentences.

Since the words in the word book are those belonging to the pupil's vocabulary, the words on a certain page might be assigned as a spelling lesson.

The teacher will find many uses for the word book not suggested in this outline.

If for any reason the work outlined for September is not completed during the month, it should be carried over into October and finished before beginning the October work.

Material for One Third Grade Room of Fifty Pupils:

1 pk. (100 pcs.) jute board 6$''$x4$\frac{5}{8}''$.
1 pk. (200 sheets) 9$''$x12$''$ white unruled paper.
$\frac{1}{2}$ yard super cut (at school) into strips 6$''$x1$''$.
1 skein linen thread.
1 yd. bookbinder's cloth cut (at school) 6$''$x3$''$.
1 pk. marble paper (100 pcs.) 6$''$x4$\frac{5}{8}''$ or construction paper.
2 pks. needles. Sufficient for one building. Pass from room to room.
1 pk. 9$''$x12$''$ tinted construction paper.

TO do as much as you can heartily and happily do each day in a well-determined direction, with a view to far-off results, with present enjoyment of one's work, is the only proper, the only essentially profitable way.—*John Ruskin.*

Possibilities in the Teaching of Printing

R. A. Loomis, Jersey City, N. J.

"The successful men are they who have worked while their neighbors' minds were vacant or occupied with passing trivialities, who have been acting while others have been wrestling with indecision. They are the men who have tried to read all that has been written about their craft, who have learned from the masters and fellow-craftsmen of experience and profited thereby, who have gone about with their eyes open, noting the good points of other men's work and considered how they might do it better. Thus they have carried themselves above mediocrity and in striving to do things the best they could, have educated themselves in the truest manner."

THE man who has followed the above quotation to its fullest extent with regard to the teaching of printing is called upon by a schoolman and a printer to talk over the establishment of a school printshop. The schoolman could see a source of profit in the school printshop and in the practice of the work a help in English and punctuation, nothing more. He regarded the work as a black, inky job, in which noise of ratelty-bang presses filled the air and masses of torn handwiped-upon-paper covered the floor—a free-for-all bedlam of machines and black devils who did not care what they did or said.

The printer in business regarded the school shop as a menace. It took away his work and flooded the trade with rascally boys who thought they knew it all but didn't know 'nuthin'. He was determined that the school shop idea should be squelched before it had even begun.

Schoolman, "Do we or don't we want a school printshop?"

Printer, "I can answer; that we don't."

"Perhaps when each of you has investigated all of the possibilities in connection with the teaching of printing in the common grade or high school you both will have changed opinions," explained the interviewed.

"Do you mean to say that printing has value other than trade preparation?" asked the schoolman.

The printer laughed, "You've got to convince me there too."

"That is just my specialty. Why didn't you see me before? I am surprised that you ask such questions," the interviewed confidently replied.

"Shoot! What is the good of printing in the school?" exploded the printer.

The schoolman was relieved and pleased at this expression of his thoughts.

"Mr. Printer, is it not this way?" said the interviewed. "You take a boy into your shop. He is an apprentice for four years. During that time has he been conscientiously taught by the foreman and journeymen printers? How much of that time did he run errands, sweep floors, wait on the men, and act the proverbial Printer's Devil? How much time did he get at the case or on the press? Perhaps when it was slack he was allowed to take a "reset" job or distribute a little type after he had managed to learn the case by stealing a glance at it now and then. He must clean up the press every night, but has the pressman shown him and explained to him how to make-ready? He might watch it being done, that's sure. The boy goes on this way for a year or two. He begins to think it rather a hopeless outlook and wonders how a printer ever became one. He says to himself, "This is some job, not for mine."

"Well, that may be true, but work must be done and I can't have my men waste time teaching boys," replied the printer.

"That's just why the school should give this training," answered the interviewed. "Why not let the school install a printshop? Yes, in the eighth grade, teach the boy how to do straight composition and correct his type, lock it up, and take a few impressions on the press, perhaps show him how to make-ready a cut job; all the time considering his ability for his work and noting his manner of working, whether in the estimation of the instructor he will make a good, careful workman who will be a credit to the craft. This preliminary instruction could last only a few months and the boy would then know whether he wants the trade or whether the trade wants him."

"That is education," recognizes the schoolman.

"Yes, all the time this shop work is going on, daily talks could be given concerning the history and development of printing, type, paper and ink. Also, illustrated talks on the industries allied to printing, such as photo-engraving, electrotyping, machine operation, offset-printing. The trade possibilities in each might be given. In short, the boy should receive a broad survey of the whole field of the printing industries, the money paid, and the possibilities for entering these trades. At the end of the brief preliminary course the boy should know whether he would like to be a printer or be in some of the numerous other allied trades. During this period he should talk the matter over with his parents, who know someone in the business or someone in the branches; the boy should become interested and visit these plants which friends conduct or in which they are working. As a result he is made, thru his school information, to become interested and is guided into something congenial or turned away from something for which he is unfitted," continued the interviewed.

"That's an idea, but now, what are you going to do with the boys who have decided to become printers?" asked the printer.

"If I could have my way I would do this,"

replied the interviewed. "In the eighth grade I would determine whether the boy were suited to the printing trade. I would try to instruct him as to its possibilities and guide him where he belongs."

"Would you neglect his academic work?" asked the schoolman.

"No, I would apply it to printing," replied the interviewed.

"For instance, how could drawing be applied to printing?" asked the schoolman.

"Let me say right here," said the interviewed, "I consider that printing, when properly taught, can be made the vehicle for every common school subject. By that, I mean, that in printing, training in the subjects: English, mathematics, science, history, and drawing, can be worked out."

After hearing this both schoolman and tradesman began to realize the possibilities in the work. Both knew that the successful printer must have a thoro knowledge of English. If he did not, how could he divide words or punctuate properly? Often the customer's copy contains wrong grammar which if printed would cast a bad reflection on the printer who did the work. If he had received ample training in English grammar in school would not his work have been of higher character?

"Yes, I always could see the possibilities for improvement in English in printing," conceded the schoolman, "but how does mathematics come in?"

"In the very beginning," replied the interviewed, "Teach the boy how to find the number of ems in type matter. Give him a price per M and let him estimate how much he would make setting bodies of type of different point."

"I'm lost," exclaimed the schoolman. "Does printing require such calculation?"

"You are just right it does," asserted the printer. "It takes much of my time figuring on such work. It took me a long time to learn how. That's just what I want my own boy to learn but I can't take time to show him. Is there a school where he can learn?"

"Yes, put him in the printing class in school and he will learn how to figure type space areas; costs of production; how many sheets of paper or card stock of any size it will take to cut any number of cards, tickets, letterheads or any size job and the cost," replied the interviewed.

"Well, if my boy could do that he could be my partner tomorrow," exclaimed the printer.

"I never imagined there was such much figuring in printing!" exlaimed the schoolman.

PUPILS IN VOCATIONAL SCHOOL NO. 24, JERSEY CITY N. J., GOING THRU THE "TRYING OUT" PROCESS.

"Not only estimating on type and paper but in calculating speeds of motors, presses, belts, cog wheels, can the mathematical work be varied," explained the interviewed.

"You have the English and mathematics cinched, but I can't see how science can be associated with printing," pondered the printer.

"The exemplification of science, perhaps depends considerably upon the resources of the instructor. He may show by explanation and visits to factories, the chemistry of paper, type and ink. The pupil in printing should know in a general way the source of paper materials,—how the pulp is prepared and colored and made into paper. The metals that compose type open up the study of geology and chemistry and metallurgy. Lead, tin and antimony compose type metal and the pupils should know the quantities and properties of each. In ink the chemistry and source of colors and bases could be discussed as well as the processes of manufacture," continued the interviewed.

"Yes, but the store of knowledge of the teacher would have to be great to present this information

so that young boys could understand it," said the printer in rather a bewildered way, as he had never stopped to consider such matters in his rush to get out orders for printing.

"It would only be the teacher's duty to inform himself to such an extent," replied the interviewed. "Further, he should go into the science of the processes germane to printing, such as electrotyping, which is a use of electrolysis, photo-engraving, which uses common chemical reaction, such as the altering of silver compounds by light and the etching of copper and zinc with acids; or color printing in which the blending of the primary colors produce all colors of the spectrum; likewise, cerotyping, aluminotyping, wall paper printing, and numerous other processes could be studied and the science of each explained."

At this the schoolman seemed considerably impressed.

"You spoke of the history of printing,—do you consider that phase important, too?" asked the printer, beginning to feel that he could be convinced of most anything educational in the subject.

"Yes; don't you think that the boy will consider the business of more importance if he learns how it has advanced thru the ages and the influence it has exerted in shaping nations? Tell him about the Chinese as first printers and also how it developed in Europe centuries afterward, independent of Asiatic influence. Let him know about the famous printshop of Plantin, how wood blocks were first printed, that the handwriting of Petrarch is the basis of our Italic letters. Tell him that William Morris of England printed books hundreds of years ago that have not been surpassed by modern printers. Come down to the modern American times and tell about Franklin, Greeley, Pulitzer and DeVinne, and the great living printers. Let him know that even now in the recently conquered sections of Poland the Germans are using the printing plants as a means of teaching their language. The history connected with printing is almost without limit and it is very interesting and important."

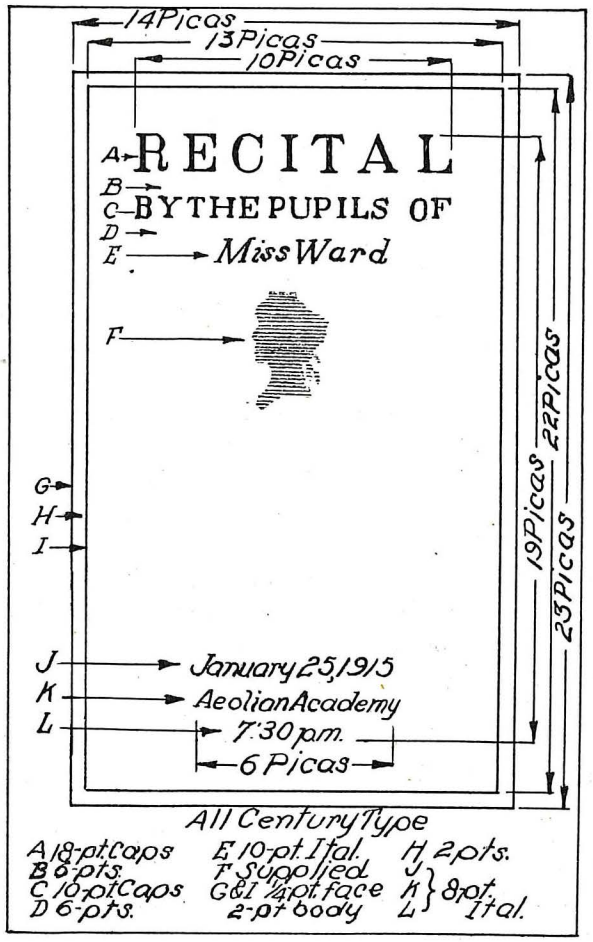
"No printer needs that to do good printing," said the tradesman.

"All printers need it to be well informed on his life work," replied the schoolman. "Don't we study history of education when we prepare to be teachers?"

"You may not be obliged to learn the history of printing to do printing," rejoined the interviewed, "but you do need what can be derived from drawing, which includes both mechanical and freehand work, lettering and design."

"To make this clear I will show you an example of the work of this character," said the interviewed.

"Let me explain this mechanical and freehand design called a layout. After the pupil has learned the case and has set up and run off several jobs of printing and has begun to have a few ideas concerning the arrangements of type and has considered its relation to size, shape, color and sentiment of the production, he may then start to design printing. The example shows the beginning of such work. He is given the rough copy and looks up specimens of similar work in the representative printing magazines as well as printing done by good printers. He gets in mind a favorable plan after considering the copy from all standpoints. Then he lays out the card in space areas, decides its size and shape with reference to the amount of material and most suitable type. The rough draft first made then he draws in the lines of type and letters them in black or colors as nearly as possible like the type and ink he intends using. This is more than drawing—it is an expression of ideas and should develop the pupil along art and drawing lines. In such work a boy may find himself and become a designer of printing or an advertising man."



A Student's Layout.

"Don't talk any more," said the printer. "If I could have been in such a class I would have been a better printer."

"We'll have printing put in grade schools as a preliminary training and then in the high schools they may pursue it still further and develop into printers, designers, and estimators," exclaimed the

schoolman. "If I had only known the possibilities before the work would have been started long ago."

"It would take long to tell all of the advantages of the school shop. The boys are always anxious to learn printing and if thru it they are kept in school longer that alone should be sufficient for its installation, not considering any of its educational and trade values," concluded the interviewed.

The Correlation of Textiles and Sewing

Helen Clark French, Somerville, Mass.

THE subject of my paper is distinctly pleasing to me because correlation has become the very warp thru which our textile course is woven. I have found that just as it is with a fabric, if the warp is weak the fabric is poor, so it is with our textile lessons if the correlation is weak, the result is poor.

Perhaps the simplest way for me to give you my ideas on this subject is to explain the lessons as we are trying to work them out in Somerville.

As I look back upon the textile course before the correlation was accomplished it seems like a constant "getting of the cart before the horse." We followed an approved course of study, proceeding from a consideration of the various fibres thru their manufacture, cloth construction, etc. I seemed, however, to be constantly teaching the girls how to shrink material and set the color *after* the need for that knowledge in the dressmaking class had passed. The girls also were taught how to know good materials, *after* they had purchased the materials for their dresses.

With our present close correlation such points are anticipated and thus the interest of the girls is more acute and the results far better.

The courses in the Somerville Vocational School are arranged in three definite cycles for each year, with special projects for every cycle. Each cycle is composed of definite educational steps with practical examinations at the close. This arrangement makes the problem of correlation a very simple one. The study of textiles is correlated with dressmaking in the cycle from September to December; with dressmaking and millinery in the cycle from December to March; and with dressmaking and economics from March to June.

The first dressmaking project is the sewing equipment, that is—wrap, bag and cushion of chambray. The girls take a piece of this chambray to their first textile lesson. This is examined under a textile glass, torn apart and discussed and in this way the students become familiar with such textile terms and their meanings as warp, filling, fibre, yarn, spin, weave and selvedge. The difference between lengthwise, crosswise, true and poor bias strips and their uses is perhaps more readily understood in a dressmaking or millinery class, after the textile lesson has given an opportunity for experimentation.

Various cloths are analyzed as to weave, the weave worked out on point paper and woven in kindergarten paper. Cloths are actually shrunk and the color set. Materials are tested in the sun for fading. Fabrics are tested for oversizing by weighing the cloth, boiling out the sizing and then weighing again.

In this way the girls learn how to buy and handle the materials for their dresses intelligently, by actual experimentation with materials instead of by lecture or textbook method.

The lessons are so planned that the girls are just ready to buy dress material and use it in their dressmaking class at the close of this cycle. Thus immediate use is made of the knowledge acquired.

The growth and manufacture of cotton fibre into cloth are discussed at this point but only to the extent needed for an intelligent appreciation of the finished material.

During the next few months the background of the work is a set of samples which each member of the class mounts on individual cards.

The work with these samples seems to me invaluable. The materials are purchased in one-half yard lengths and cut into samples by the girls. This gives splendid opportunity for getting the feel of the different materials. The mounting gives excellent training in accuracy in hand work. The matter of holding the attention of individual girls to the one material under discussion is simple when each student has her own piece in addition to the large pieces for general use.

The object of this particular phase of the work is to teach the recognition by name of the standard cotton materials, their weaves, qualities, prices, uses, finishes, colors and adulterations. No textbook is used by the students and the course is interrupted at many points for experiments with materials which the girls buy and are using in the dressmaking class.

The fabrics are studied in groups according to their uses and the projects in the dressmaking and millinery classes. For example the first group is made up of the standard dress materials which are discussed while the girls are making dresses. Other groups are "household" including sheetings, tickings, curtain materials, etc. (our hospital orders furnish a background for this group) and the millinery group including cambric, crinoline, buckram, willow, etc.

This plan of lessons continues until April with an interruption of two weeks in early March. At this time the girls are entering a new cycle in their dressmaking with the making of a woolen dress.

Altho a definite study of woolen materials is not undertaken until the second year some experiments are made at this point to show the adulterations common to woolen materials. These lessons seem perhaps to the ordinary observer to be out of their logical position and yet experience has taught me that they are more valuable to the girl now and she gets more from them *now* than at a time when she is not about to use the knowledge. Also I like to feel that we have avoided some wasteful buying.

The last two months of the first year linen materials are mounted and discussed in connection with the economics lessons. Here, too, intelligent buying is the goal toward which we strive. When the attention of the class is directed toward table service in their economics course, table linens are being discussed in their textile lessons. Much interest is displayed and much valuable information obtained by the girls in the lessons in which the contents of a bride's chest are planned. This is arranged for a girl whose salary is not more than eight dollars a week.

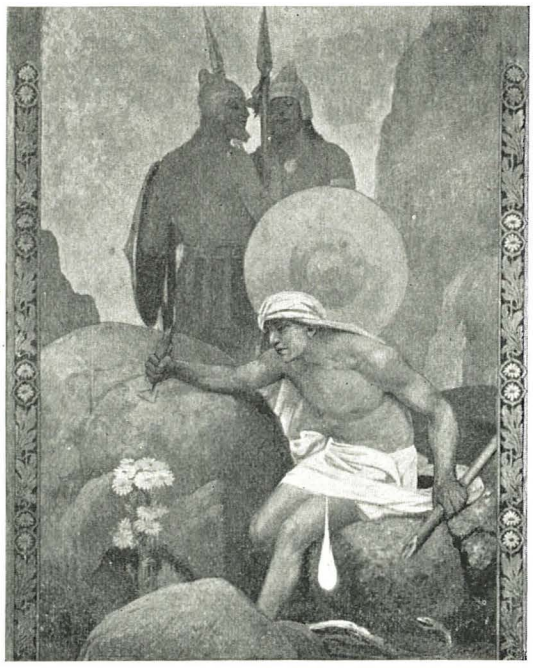
In the fall of the second year, a committee of three is elected whose responsibility it is to test all materials in use in the school and any that may be brought in to be tested. Each committee serves but two weeks as all the girls want the privilege of serving. A record of the work is kept and is read by the chairman when the book is given over to the newly elected committee. This gives a field for competition and the girls get much more practice in test work because each desires to be a member of the committee that does the largest amount of satisfactory test work. Whenever it is possible a piece of the tested material is mounted with the test findings and the results of wear are followed up and recorded on this same card from time to time.

This year the girls tested with a great deal of pleasure as well as profit all the materials worn by a wedding party. Several girls brought scraps from their father's and brother's suits to see if they ought to wear well or were worth a certain price.

As in the first year work, the mounting of samples furnishes a background for the various experiments. Woolen materials are studied during the first half year when the girls are making woolen dresses and the second half year silk materials furnish the field for experiment. But the lessons are not confined to the study of materials sold by the yard alone. Ready-made garments are discussed as to durability and appropriateness of material and various clothing budgets are made out.

In this paper I have attempted to give a suggestion of the manner in which our textile course is taught in relation to the sewing. I would like to add one thought in closing. This correlation of textiles with *sewing* is only one phase of the plan, the course is in reality intimately associated with almost every branch of the school work and not only that but it has correlated itself with the home.

The girls themselves bring evidence of this to the lessons in the form of questions brought to their mind in other classes, newspaper and magazine clippings and samples to be tested. This I consider one of the best results.



Mural Decoration for the Eastern District High School,
New York City.
Painted by Frederick Lincoln Stoddard.

RELATED ENGLISH OF COOKING

Alice L. Gookin, Formerly Director of Girls' Department, Lowell Vocational School, Washington, D. C.

IN discussing the subject of Related Work, I feel it appropriate to define the term *related*, as used in this connection. English work which follows the lead of process work or which centers about the subject matter given in the kitchen is properly named *Related* Work.

As is stated in the last Bulletin on Vocational Schools by the State Board of Massachusetts,—"The method of developing vocational training is from the concrete to the abstract. Process work—that part of the training which aims to give manipulative skill in cooking and laundering—is the *core* of the English instruction."

The lesson in English, coming shortly after the process-work, has a two-fold value, that of strengthening and clarifying the impressions already formed in the cooking room and that of enforcing the instruction in English. Very often vague or incorrect ideas are eliminated by the secondary lessons given by the teacher of English. For example, a child may have set a table under a teacher's direction and even may have taken notes, yet a week afterwards, in other surroundings, she may become puzzled over the problem whether the sharp edge of the knife should be placed toward or away from the plate. The mental picture was not clear, the matter taught was not sufficiently impressed by written work, illustrated with pen sketches. The value of the interplay between the two departments is manifest at this time. Each teacher knows that she approaches her subject from an altogether different angle; that the process work forms the interesting nucleus for the English work; that the oral and written repetition reacts in favor of the domestic course by clinching the child's knowledge. The mutual dependence of the two teachers brings about ideal related work. For instance, "a lesson explaining the chemical composition of bread and the chemical changes which take place in the process of bread making should immediately follow the baking of bread in the kitchen." This supplementary instruction by the English teacher strengthens the memory thru repetition, sharpens the observing faculties thru skillful questioning and altho oral, is a source of power when the pupil is asked, later on, to write a description of the process.

How is the English teacher to keep in touch with the cooking schedule so that she may present her related work at the most auspicious time? In our school the teacher of cooking sends to the English teacher every two weeks, an outline of the work covered during that time. The teacher of English makes visits to the cooking department during her free time in order to confer with the cooking teacher concerning the essential points of technical work and the phases of English which the trade teacher thinks need special attention.

The training in English given these girls must of necessity depend also upon their previous academic work. About fifty per cent of our girls are graduates of the grammar school, and our relations with these pupils are most pleasing and satisfactory. It is the second class of girls, the grammar school undergraduates, that tests the worth and efficacy of the English course. There is no step too simple for this type of girl; she has to be taught the very rudiments of English, which exacts much individual attention from the teacher and weakens the effectiveness of her labor with the more advanced pupils.

Since it is sound pedagogy to adapt one's teaching to the ability of the brighter half of a class, I shall continue my discussion without further reference to the sub-stratum. The grammar-school graduate strongly resents any effort to review elementary-school English, hence the teacher sees the need of her presenting old facts from a new point of view, and of the pupils' applying their knowledge of English to vocational work. To accomplish this the tactful teacher wins their co-operation by showing them the vital necessity of knowing the right and wrong forms in ordinary conversation and in written work. This is an opportune time to insert lessons on grammatical expressions and a daily drill, lasting for three months, does not seem too much time for this intensive study. For this purpose I have mimeographed copies of right and wrong grammatical forms which the pupils use and find very interesting as well as instructive. For example:

$$\text{It is } \begin{Bmatrix}\text{she}\\\text{her}\end{Bmatrix} \quad \begin{Bmatrix}\text{he}\\\text{him}\end{Bmatrix} \quad \begin{Bmatrix}\text{me}\\\text{I}\end{Bmatrix}$$

$$\left.\begin{matrix}\text{Who}\\\text{Whom}\end{matrix}\right\} \text{did you send?}$$

Divide it between (she or her) and (me or I), etc.

In the early part of the first school year I always find the cooking teachers desirous that girls should become familiar with the spelling of common housekeeping words. These words are mimeographed so that each girl has her own copy; the girls are required to memorize the spelling, define each word and use it correctly. At this point I try to interest the girls in the enlargement of their vocabulary, to introduce or review the value of diacritical marks and to foster an abiding devotion to the dictionary.

Another phase of preliminary English work which challenges attention during the first few months is

common sense punctuation and it should be established at the outset that no punctuation mark should be used which does not help to make the meaning clearer. This work will include a thoro review of the use of the period, the comma, the capital letter, the abbreviations in common social use and those used by the cooking teacher, the indentation of paragraphs, etc. I provide exercises involving the application of the rules of punctuation and capitalization and find that such work, together with the spelling and grammatical expression, form the essentials upon which all advanced work in English must be based.

Since the aim of vocational English is to enable the pupil to think clearly and to express accurately, the question arises how this perfect expression may best be accomplished. In English work correlated with cooking there is *one* best way of describing a process of writing a recipe. This kind of English work must, of necessity, be either descriptive or expository; it must be clear, precise, forceful; it must be oral at first and later written. There are no textbooks on vocational exposition; the wide-awake teacher must devise her own text. In connection with cooking there is a great mass of material for work in expository theme drawn from the thought-world of the pupil,—their experimental work. For example:

Cake Making,
Cleaning the Gas Stove,
Value of Sunshine,
Care of a Refrigerator,
How to Mark Table Linen.

Topics which are allied with these include *description* also, as studies of materials with which they work as wheat, salt, coffee, tapioca, etc., or the routes of transportation, refrigerator cars, etc.

Another less important phase of English work involves the writing of formal and informal invitations to luncheon or dinner, the making of place cards, the writing of a menu and business notes.

This work, as I have outlined it, will be continued thruout the two years, but I agree with Sherwin Cody that vocational students should have some literature in order to widen their intellectual horizon. He writes: "On literature almost alone in a vocational course rests the duty of enriching life or teaching the subtle pleasures of emotion, refinement and culture. Trade students need literary study even more than classical students, since it is almost their only cultural training. If making a mere living thru cookery were all there is to life, then life is a failure."

As in first year English, the study of literature must, of necessity, be along broad, simple lines. First there should be a study of what goes to make up a good poem, a good essay or a good novel so that the girls shall have some standards by which to judge. Ten or eleven of the great writers, about whom it is a disgrace not to know, should be made vivid and interesting personalities and the most interesting spots of their most interesting work should be selected for reading and furnishing material for general conversation. The works studied must be carefully trimmed down so that the great scenes and the great moments are retained while the lesser scenes are passed over. Vocational students have to learn the art of skipping or the time for reading will prove too short and they will become discouraged and give up the reading-habit altogether. The pupils should be encouraged to do most of their reading at home while one day a week might be given to the pure enjoyment of literature.

In connection with cooking, the masterpieces of literature furnish an abundance of material which will prove most delightful; for instance:

Bob Cratchit's Dinner in Dickens' "Christmas Carol."
Gypsy Cooking in Scott's "Guy Mannering."
Banquet to Elizabeth in Scott's "Kenilworth."
Niobe's Dinner in the "Iliad."
The Workhouse Dinner in Dickens' "Oliver Twist."

Essays of Elia, Roast Pig and Grace before Meat by Chas. Lamb, and dinners too numerous to mention in Pickwick Papers.

Such literature study in a vocational course gives the practical English work of the first year its necessary balance; it lays the foundation for the true enjoyment of life for which all work and business exist and also creates that intangible reserve power of thought and expression which is recognized by employers as one of the best qualifications for promotion.

Patience is due the pupil; were he as fully informed as yourself, you wouldn't expect him to be a pupil.

APPLIED WOOD-TURNING

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Indianapolis

THERE is a strong tendency on the part of many high schools thruout the country to stick too closely to the mission type of furniture in the cabinet-making course. Mission furniture is a good type of furniture and has served, and is serving, its purpose well in the school shops. However, its limitations are many both in design and construction, when compared to some of the other types of furniture. I believe that a course in cabinet-making should be

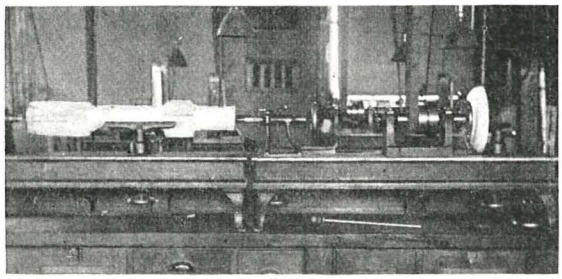


Fig. 1.

as broad as possible. One thing that it should require is the use of as many tools as can be successfully handled by the boy. Why not give the boy a broader training both in design and construction by allowing him to design and build furniture that utilizes curved lines as well as straight lines?

The introduction of wood-turning into the cabinet-making course is an excellent way to get into this broader field. When an elementary course in wood-turning and bench work precedes the making of a piece of furniture, the range of possible designs becomes almost unlimited. If the project is to be a turned floor lamp, costumer, or fan stand, then we have approximately the same narrowness of work as in the mission, so far as the construction goes. But pieces of furniture such as the library table, tea wagon, four-poster bedstead, piano bench, sewing

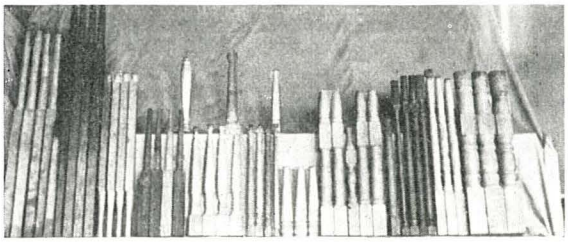


Fig. 2.

table, chair, music or record cabinet, or silver cabinet (on legs), offer a happy medium between straight and turned work. Will not a boy learn more woodworking by having made one of the above mentioned pieces with turned legs instead of square or tapered legs? The only thing that he could miss would be the squaring up of the leg. As most of the designs call for at least a portion of the leg square, really none of this squaring up work is missed by having turned legs. In fact he would have a chance to learn everything offered on straight work, plus the turning. This would also give him a chance to apply the principles taught in elementary wood-turning as well as those taught in bench work.

There are a number of types of period furniture worth studying when one is looking for designs that include turned work. William and Mary, Jacobean, Adam, Sheraton, Colonial, Elizabethan, Queen Anne,

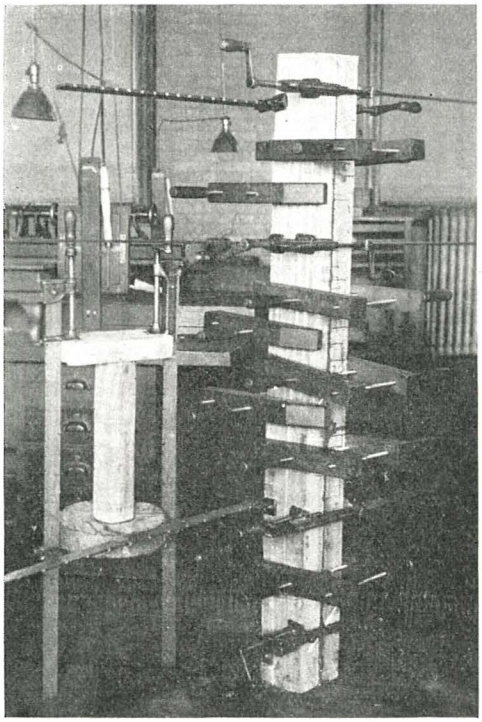


Fig. 3.

Flemish and Dutch, and Louis XVI all offer examples of turning. Turning plays a minor part on some of these types. However, the four-poster bedsteads in all of these types usually have the posts turned. The average high school boy's experience with furniture is very narrow. Therefore it is very necessary that he have access to authoritative designs of furniture before attempting to design a piece for himself. There are a great many publications available along this line, and the boy should be encouraged to utilize the best of these.

The lack of the right equipment sometimes prevents one from introducing turnings longer than 24 inches. Most schools with a wood-turning shop have the 24-inch lathes. At least one solution of the

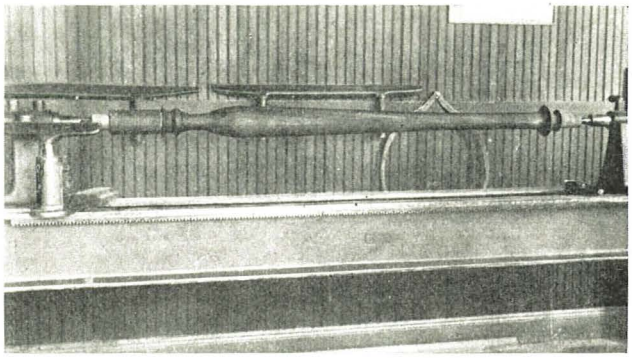


Fig. 4.

problem is as follows. By removing the headstock from one of the lathes and pushing two lathes together, as shown in Figure 1, it is possible to swing a six-foot piece. It does not necessarily follow that the lathe will swing pieces of any length between 24 inches and 72 inches. For example, the lathe shown in Figure 1 will not swing a piece 29 inches in length. It was necessary to order a 33-inch piece in order that it reach the centers. Therefore, it is always advisable to measure the shortest possible distance between centers before making out the mill bill for the stock. The waste stock may be removed after the turning is completed, either by turning at the dead center end or by sawing at the squared end. Face-plate work may also be done on the lathe at the same time that a leg is being turned. (Figure 1). The floor lamp, Figure 7, was turned by using two lathes in this way. A floor rest was used to reach a part of the shaft that the rests on the lathe would not reach. The base was turned on the back of the lathe shown in Figure 4, using a floor rest upon which to rest the tool. Unless an iron floor rest is already a part of the equipment, one can be made in the following way. Secure a 4-inch by 4-inch for the shaft of the rest. Three pieces of 2 inches by 4 inches may be fastened to this to serve as legs. A

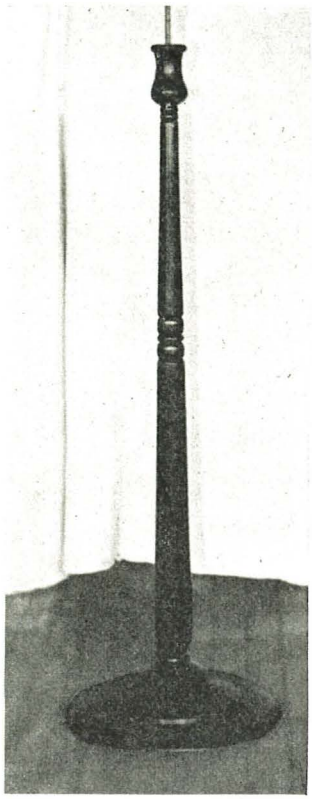


Fig. 7.

piece of 2 inches by 4 inches across the top of the 4-inch by 4-inch can serve as a T-rest if a brace is run from either end back to the 4-inch by 4-inch. The T-rest should have a strip of iron screwed across the top of it. If one is lucky enough to have a shop equipped with motor head lathes, I believe this pushing together arrangement can still be worked, in order to turn long pieces.

It can readily be seen that this method of getting out turnings in a class of 24 pupils will cut the turning capacity of the class to twelve. In order to avoid having some of the pupils get behind with their work it will be necessary to divide the class in two sections.

Fig. 5.

Fig. 6.

While the first section is working on the lathes have the second section working on the bench part of the projects. In this way steady work for the entire class is provided.

Figure 2 shows a group of turnings almost ready to assemble. These were made by boys in the second semester of the Freshman Year.

Figure 3 shows a method of assembling a table lamp before it is turned. This method is rarely used in factories but when faceplates are scarce, it is one way to get out the work. On the right side of Figure 3 is shown a way to glue up the shaft of a floor lamp. The faces to be glued should be jointed, and have a groove $\frac{3}{8}$ inch deep and $\frac{3}{4}$ inch wide cut in the center before being glued up.

Figure 4 shows the finished shaft of a floor lamp turned in a large lathe. Note the maple dowel in the live center end. Mahogany is so soft that it will not hold the center firmly.

Figure 5 shows a finished library table. The copper drawer pull was designed and made by the boy who designed and made the table. The table is made of quartered white oak and finished nut brown.

Figure 6 shows a finished study table for a boy's room. It is made of quartered white oak and fumed a dark brown.

All of the work shown here was made by boys in the second semester of the Freshman Year.

How the Shop Classes Helped in Equipping the School Gymnasium

Frank Moeser, Waverly, N. Y.

SINCE the building in which our shops are located was new and included a large gymnasium, we decided it would be a poor investment, considering the entire student body, not to have some other kind of indoor athletic work besides basketball and indoor baseball. After all the machinery was installed in the shops and the classes were running on schedule time we started work on a horizontal bar.

As a shop project this afforded the instructor a fine opportunity for correlating the work and making one class work in conjunction with another without resorting to exercises; it also avoided the possibility of loss of interest in the work. Taking into consideration the fact that our machine shop is equipped with one screw cutting lathe and one drill press only, we feel that we have done a first class job in constructing this project with these two machines alone.

The first part started was the steel half of the bar end, which was cut from a $2\frac{1}{4}$-inch bar of cold rolled steel. We have no power hack saw in our shop and I think that any instructor of machine shop practice will agree that after a boy has cut a bar of steel of this size, he will not need any practice in the use of a hack saw for some time to come. When the steel was cut, one end was chucked up true in the lathe chuck and the other end centered. After centering, the tail stock of the lathe was brought up and the center screwed into the center hole, to steady the stock which was to be turned down to $1\frac{3}{4}$ inch diameter $2\frac{7}{8}$ inches long. The steady rest was then brought into use. After adjusting the jaws to their proper place, the tail stock was moved back, and a one-inch hole drilled into the end of the steel $2\frac{1}{4}$ inches deep. This drill was the largest of our equipment, and the specifications for the bar called for $1\frac{1}{8}$-inch holes. We had no $1\frac{1}{8}$-inch reamer, so it was necessary to do some accurate boring on this piece.

After the lathe work was completed we had drill press and milling work still to do. Having no milling machine, all this must be done either by hand (by chipping and filing) or our drill press must do the work of a milling machine. The bar end was clamped on to the drill press table and the hole A was drilled and bored. The drilling and boring of this one hole gave an opportunity for learning means of obtaining large size holes without the use of large size drills. As stated before we had no drill larger than one inch. Before this bar end was clamped on to the drill press table a bushing was made to fit the center hole in the table and a one-inch reamed hole finished thru the center. A boring bar turned down to one inch in diameter had a square hole filed thru its center to receive the cutter. This bar was then used to bore out all holes larger than one inch.

After boring hole A, the section B was sawed out and surface C was filed up square with hole A. This gave a surface to square up by, in drilling the other holes. When surface C was finished, the holes D and E were laid out in the proper places and the end again clamped on to the table with surface C squared at right angles to the table. After drilling hole D a sweep was used to cut out the metal F on the one side, and was then set up again to cut F on the other side.

With the holes D and E finished, and the metal F and F′ removed, we still had to cut the slot G in the end. To do this the steel was set up with end H on the drill press table and two $\frac{3}{8}$-inch holes were drilled down thru where slot G should be located. These holes were laid out $\frac{5}{8}$ inch from center to center in order to have them run together and make less work in filing out the slot. After these holes were drilled, all machine work was done on this piece until the bar was ready for assembling.

The boys then received some very good practice in chipping and filing without the necessity of using practice pieces and in addition were sure of the fact that their product would have practical value.

In working up the bar end hinge we had an opportunity for practical work in pattern making. This pattern, as well as the patterns for the floor flanges and wall bracket, were made by the class in woodworking, and it gave an opportunity for working one class in conjunction with another and correlating the work.

When the castings for the bar end hinge arrived, the slots were filed out to size, and the holes drilled and tapped out to receive the screw. The hinge was then placed in position on the bar end, and the hole bored out to finished dimensions, by clamping on to the drill press table.

For the bar standards we used $1\frac{1}{2}$-inch wrought iron pipe. When we came to drill the holes for locating the pins in the bar end, we had a proposition which called for an absolutely fool-proof jig, in order to get all holes in a straight line and equal distances apart. I found that trying to drill these holes without a jig of this kind was a waste of time.

A piece of flat iron $\frac{1}{2}$ in. by 3 ft. was heated in the forge and bent as shown in drawing, Fig. 1. A 9/16-in. hole was drilled in the bottom and the jig clamped on to the table in the proper position. Two $\frac{1}{4}$-in. holes, A—A, were drilled into the top, 15/16 in. from side B and 2 in. from center to center. In drilling the holes in the standard it was set on parallels and clamped tight against side B of the drill jig. After the first hole was drilled it was a simple process to advance the standard and insert the pin C thru the holes and drill the next hole. In this way each standard was drilled correctly and each hole was accurately spaced.

The top piece for the outside standard was also cut from the $2\frac{1}{4}$-in. bar of cold rolled steel and worked up in the following manner: When the location of the large hole had been determined by a center punch mark, it was clamped upon the face plate of the lathe and a one-inch hole was drilled to the required depth, after which a boring bar was used to finish the hole to size. It was then clamped into place on the drill press and the holes were drilled in each end. After all the machine work was finished, the boys again had a fine time chipping and filing this piece to the dimensions and form shown in the detail drawing of the bar.

The wall bracket was clamped on to the face plate of the lathe in order to bore out the hole for the fixed standard. This hole was bored slightly larger than the diameter of the standard in order to allow

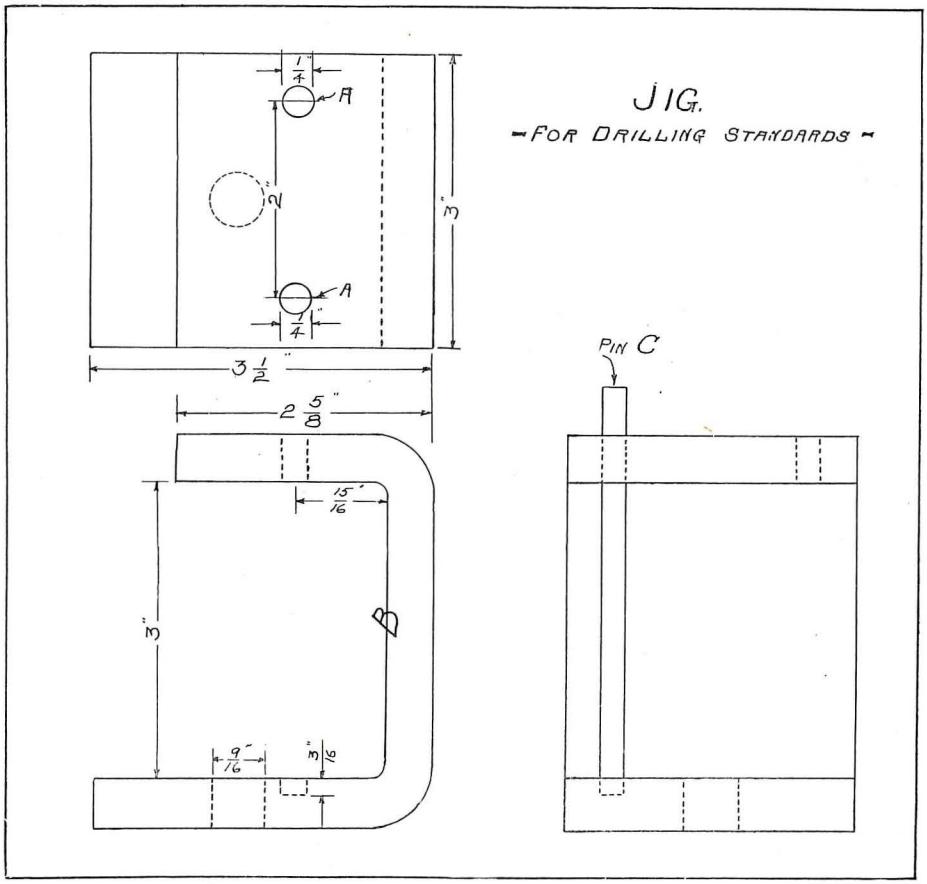
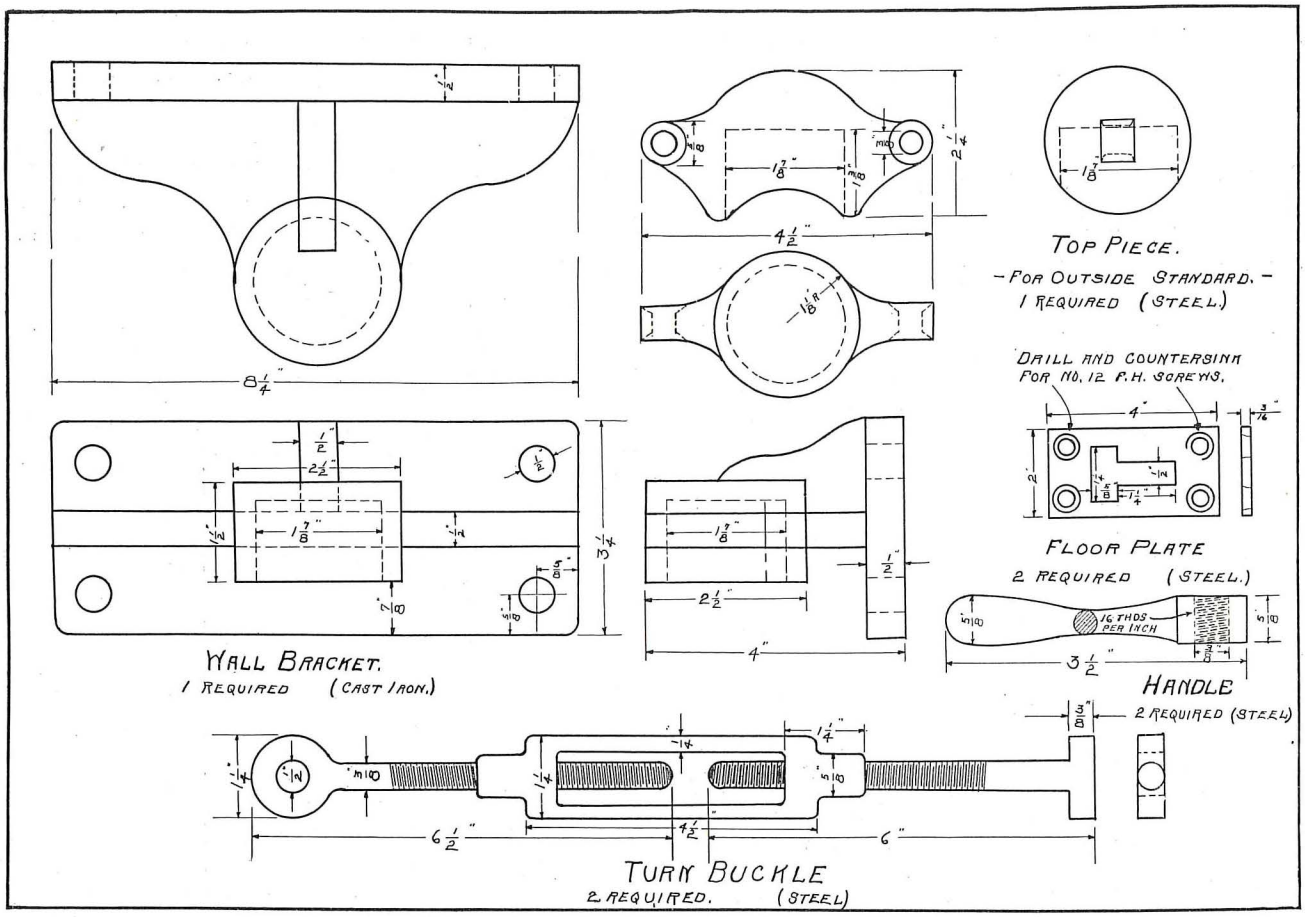
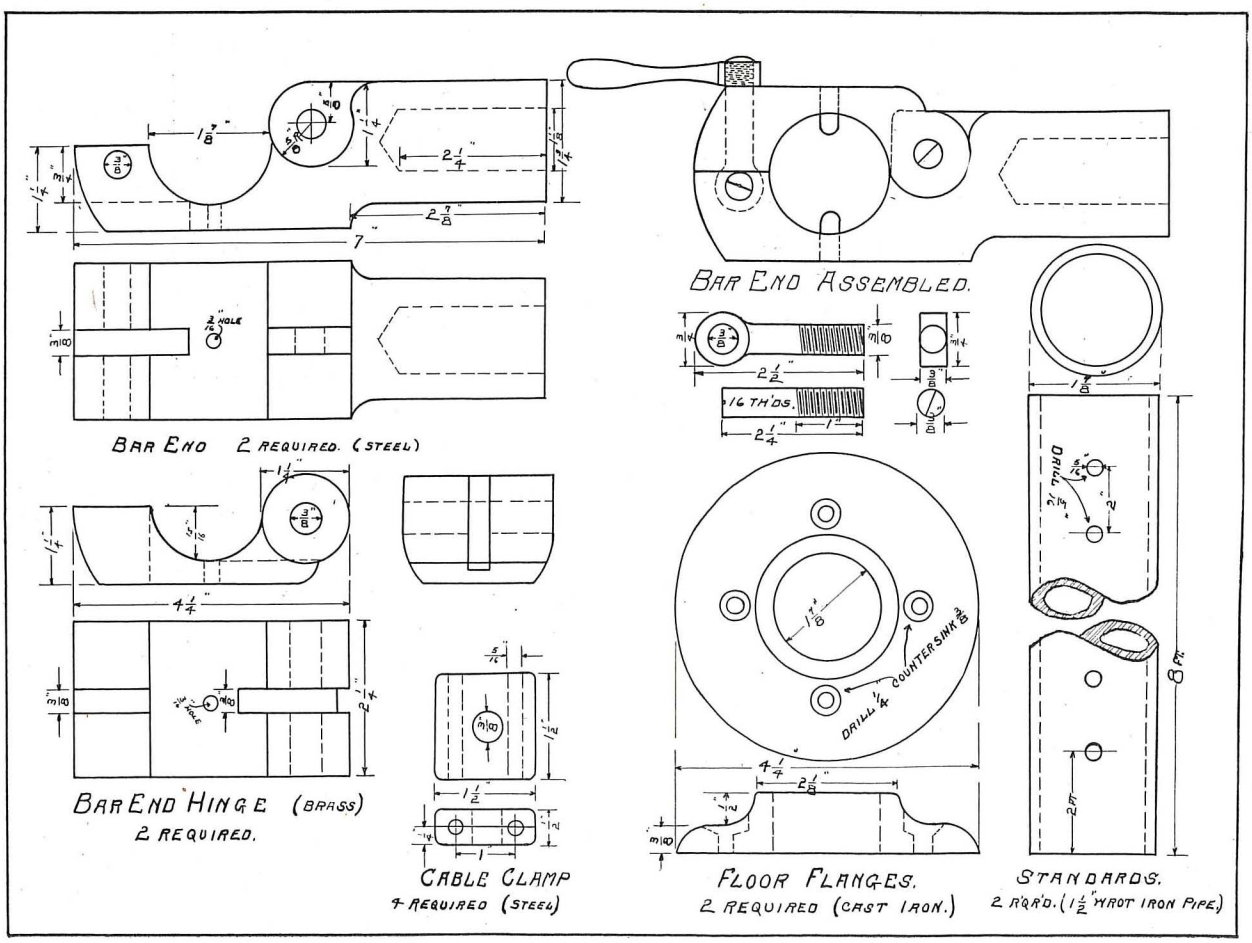


FIG. 1. DETAILS OF JIG.





DETAILS OF HORIZONTAL BAR.

the bar to be swung against the wall out of the way without taking it down.

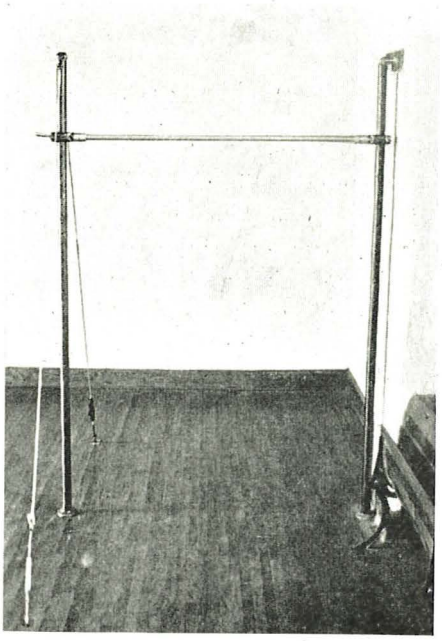
The floor flanges were cast solid and chucked up in the lathe and bored out. One was bored to make a good driving fit on to the end of one standard and the other bored out larger than the standard, or to the same size as the wall bracket. This larger flange was screwed on to the floor and the other was driven and pinned on to the end of the outside standard. This flange had two pins driven thru it to fit two holes in the floor. In setting up the bar it was swung out from the wall and the two pins were located in their separate holes, after which the turn buckles were set in place in the floor plates and screwed up tight.

The turn buckles were bought from the hardware store and the screws taken out and new screws made by turning down some $\frac{3}{8}$ in. by $1\frac{1}{4}$ in. flat steel, and threaded as shown in the drawing. These turn buckles and the 5/16-in. cable, which was used for supporting the outside standard, were the only materials not actually worked up by the class.

The floor plates were made from sheet of 3/16-in. wrought iron. The holes for the slot were first drilled and then filed out as shown in the drawing.

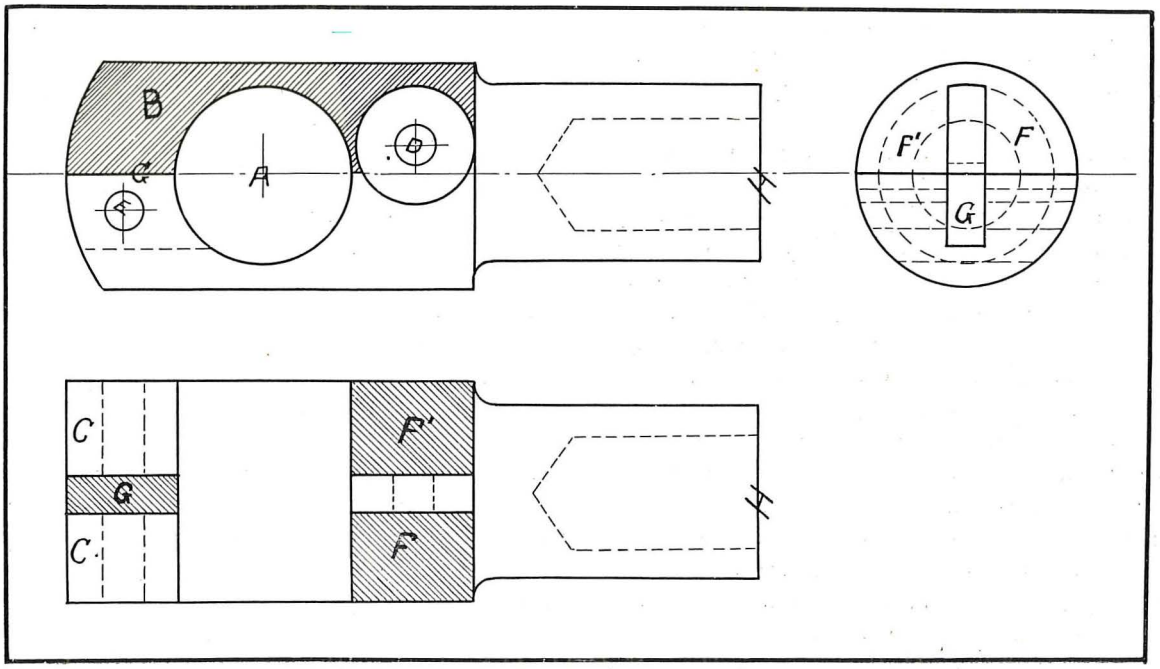
In speaking of drawing I might add here that this project afforded some good problems in mechanical drawing for the classes—things which they could see clearly after having worked on them in the shops.

Taken as a whole this project gave the instructor a fine opportunity to introduce many processes in machine shop practice, some of which were



The Bar in Position for Use.

drilling, reaming, straight turning, use of steady rest, boring, irregular turning, boring in the drill press, countersinking, counterboring, chipping and filing, thread-cutting, etc. Inasmuch as a bar of this kind sells for $34, we feel that we have accomplished something worth while with our machine shop class. The material for our bar cost less than four dollars but I will not attempt to say here how many dollars' worth of good, interesting work the boys have received in the building, and are still able to receive, in the use of this shop project.



DETAILS OF BAR END.

Development of Water Color in Primary Grades

PLANT-LIFE PAINTING

Martin F. Gleason, Supervisor of Art and Construction, Joliet, Illinois

(Third Article)

Introducing Mixing of Colors in the Brush.

IN no place is it more true that "a good beginning is half the battle" than it is in working out this phase of water-color painting. There is no place in all the work where it is possible to do more actually beneficial teaching than we may do here. Besides providing opportunity for the development of brush handling and color properties, work in plant-life demands that the children observe closely and they may be held to very definite expression of whatever model is put before them. There is a charm in this branch of the work that is stimulating, keeping the interest of the children at high-tide, and when the interest is great, teaching becomes easy, provided we have our subject well enough in mind to be able to present it in the proper way.

Our success here depends very much on how we begin and how we keep adding little by little to the beginning which we make. Much depends on our choice of specimen for the grade in which we are working. Nature will furnish us with models suited to any grade if we are able to choose wisely. We may find those simple in form and color for the beginner and others more complicated in form and color, and perhaps more interesting to a more mature mind, for advanced students. The model to be chosen should meet several definite requirements—first of all it should be interesting and attractive, it should correspond to the ability of the children to whom it is to be presented, and lastly it should be one which will permit teaching. This last requirement will be made more clear thru future statements and illustrations.

Teaching of flower shapes, leaf shapes, and the general characteristics of plant life may be made strong thru demonstration. The brush will do much toward bringing good results if children know how to use it and there is no better way of getting them to use it properly than thru demonstrating. Much will be said in this chapter about brush handling in hope that what is said will be of help to those teachers who do not feel prepared to paint before their classes.

The care of the brush, when not in use, was discussed in a previous article. At no other time will the necessity of having a well shaped and well cared-for brush be more evident than in the painting of leaves, flowers and stems. The lack of shape and care will be just as evident in the results. It is impossible for the child to express himself in any form unless he has the proper means of expression. The brush is most instrumental here in doing the work and if you would expect good results see to it that it is kept in a good working condition.

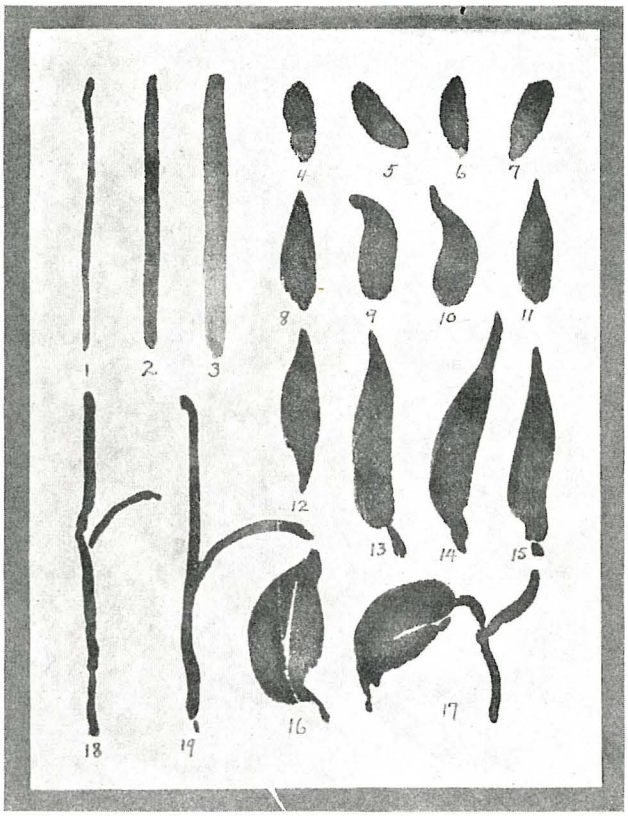


Plate XIII.

Plate XIII shows brush strokes made with a brush very full of color and water. Nos. 1, 2 and 3 were made with the brush held perpendicularly, the varying widths being produced by changing the pressure on the brush. Heavier pressure will cause the brush to flatten and the wider stroke is the result. Nos. 4, 5, 6 and 7 were made by laying the filled brush down flat on the paper and the color spot took on the shape of the brush. No. 8 was made by beginning at the top with the point of the brush and bringing it down flatter and flatter until the desired width was obtained. This width was continued to produce the length of stroke wanted. Nos. 9, 10 and 11 show such strokes as No. 8 illustrates suggesting leaf shapes. No. 12 shows the same stroke as that just described, excepting at the lower end the brush was lifted gradually and the stroke ended in a point, as it began. Nos. 13, 14 and 15 show simple leaf shapes made with one brush stroke. The stems were added with just a touch of the brush. Nos. 16 and 17 show leaves made with two strokes, one for each side. Notice the broken line of the color of the paper. This kind of line is of value in suggesting the mid-rib. Nos. 18 and 19 illustrate painting of plant stems and the joining of

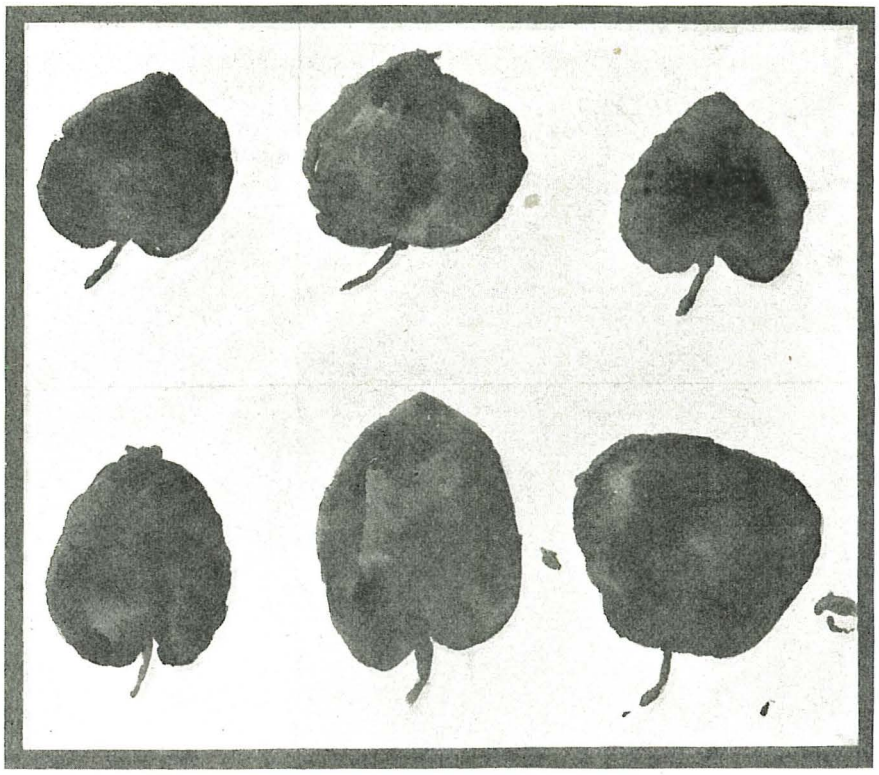


Plate XIV. Brush Work in Leaf Shape Development.

one part to another. Notice that the horizontal stem is swung in in such a way as to suggest that if it were continued it would fall into the line of direction of the perpendicular part. Such a swing as this is obtained only thru the free use of the brush. Develop this use as much as you can.

Plate XIV shows the work of a first grade child in the free handling of the brush and color to obtain

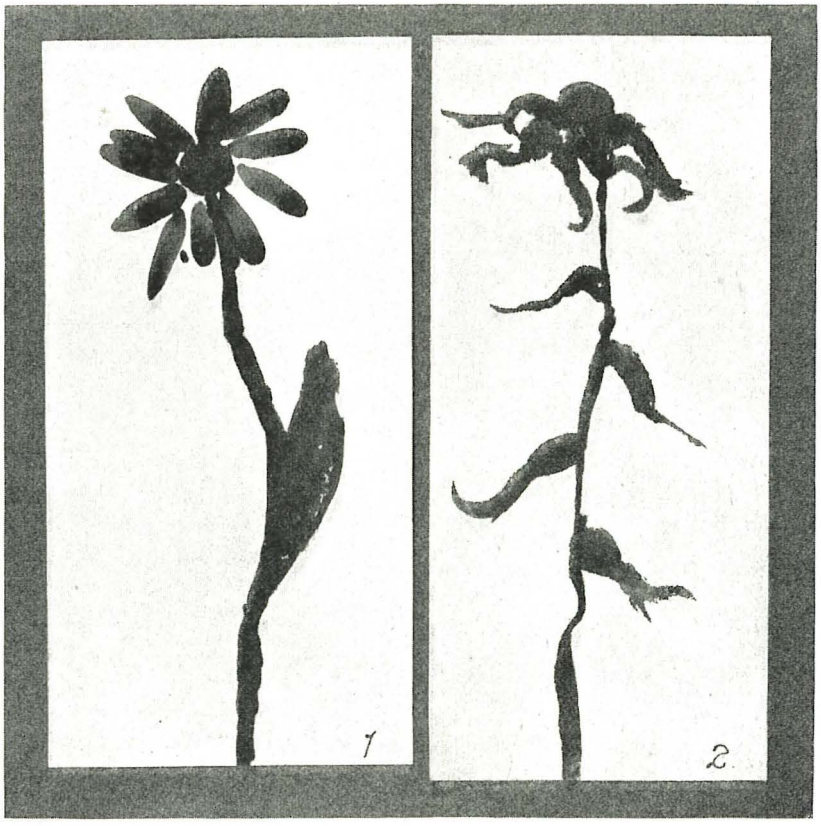


Plate XV.

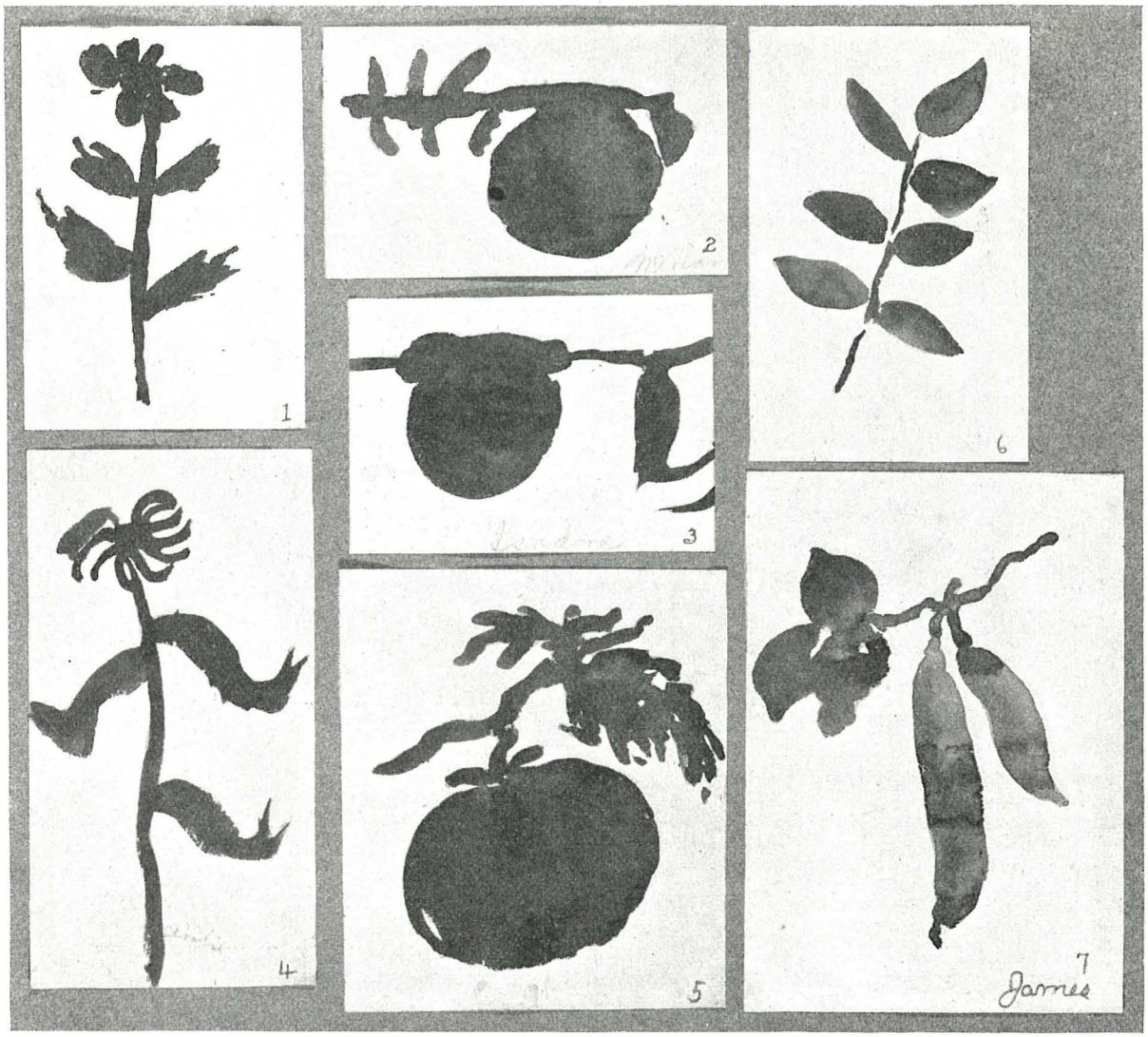


Plate XIX.

leaf shapes. The papers were first folded into oblongs to help in the arrangement of the shapes. Thru plant-life painting we have opportunity for introducing another method of mixing color. There will be times when the first method suggested will be found of value in this work but for the greater part mixing in the brush should be practiced.

When using this method of mixing in the brush it is very essential that the cakes of paint be moist enough to give off color quite freely. An earlier reference was made as to the way of keeping the cakes moist. Thru previous illustration and explanation directions for taking up color in the brush were given. When mixing for green the yellow should be taken up as directed, and following this blue should be taken up in the brush in the same way. When beginning this method it might be well in the first few lessons to direct the number of times that the brush is to be passed over the cakes of color. This will help somewhat in obtaining the proper mixture.

When the brush is applied to the paper to paint a leaf shape, traces of yellow and blue will be found intermingling with the green formed by the mixture of the two colors in the brush. This is not to be found fault with, but rather commended. This effect is very desirable as it helps in suggesting modelling of the leaf shape, adds much variety to color, and will lend much life and charm to whatever is painted.

When selecting specimens for the first work we should choose those the execution of which will be within the capabilities of beginners. The Brown-eyed Susan is a plant presenting opportunity for the development of good, simple brush handling in the leaves and petals. Perhaps the view which will be easiest to show at first is the full face, with its brown center and radiating petals. Before painting this view talk with the children about the order in arrangement and try to get them to realize that they are painting only one view of the flower. Do whatever you can here to help hold the children to the expression of facts.

Fig. 1, Plate XV shows a full face view of the flower suggested. One can readily see that the petals

were obtained by laying the brush on the paper and flattening it. The impression left gave what seemed to the child a desirable shape for the petals. The stem was made with one stroke of the brush, held perpendicularly. In the leaf shape observe that the end of the stroke is pointed and at the center it increases in width. Fig. 2 shows the side view of the same flower. Notice the real charm which the first grade youngster who painted the illustration put into it thru the skillful use of the brush. Notice what the varying pressure on the brush did for the leaf shapes.

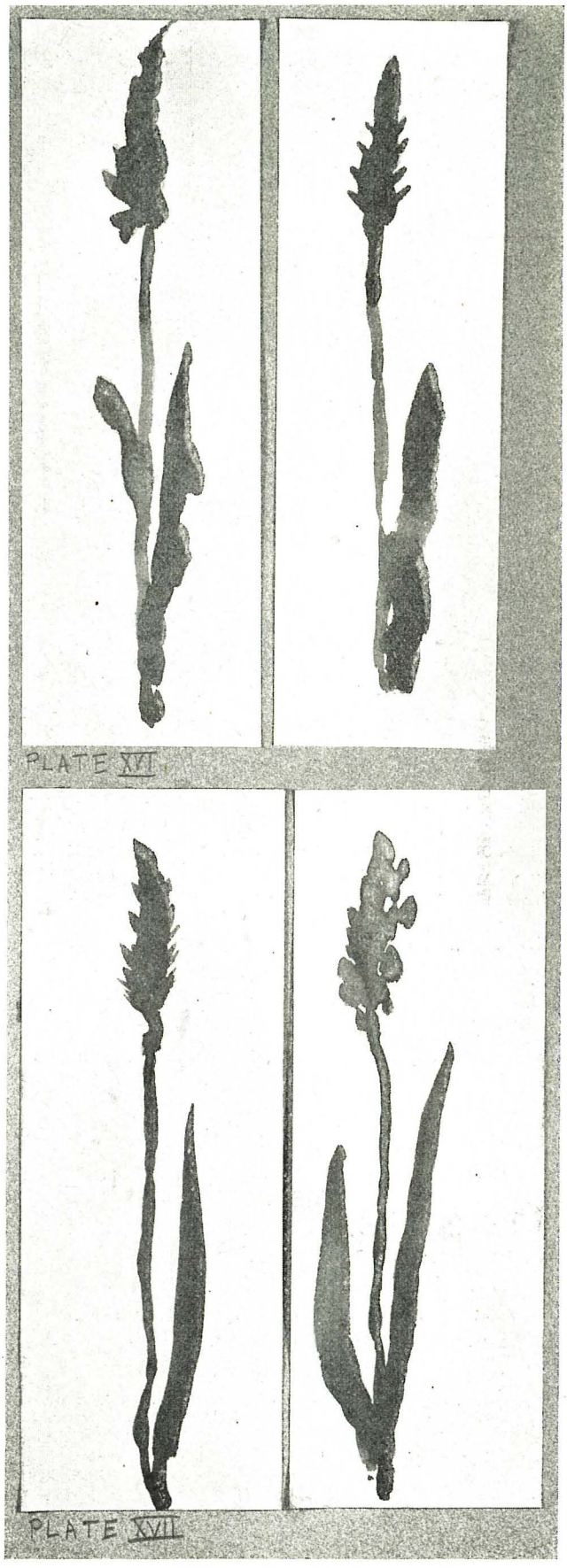
The teacher may do much good developing by having children observe the shapes of leaves and petals and showing thru demonstration how to form them with the brush. Children may do some experimenting on a separate piece of paper before painting the flower study. Observation to obtain facts concerning plant characteristics and imitation in developing technique will go a long way toward bringing satisfactory results in this line of work.

The illustrations in Plate XV show only very simple growth. Great care should be exercised in choosing models that are simple. The elimination of all unnecessary parts which add to the intricacy of the model will do much toward the production of good results.

Grasses with their shaggy heads and long slender stems and leaves furnish pleasing models for painting and excellent problems for practice in brush handling. Plate XVI shows examples of the work of first grade children. The shaggy effect of the heads was obtained by drawing out little threads of color from the first brush stroke made while it was still moist. Plate XVII shows the work of third grade children. Notice the little spots of the color of the paper left between the different parts of the plant. These are very helpful in retaining the shapes of the different parts and also add very greatly to the attractiveness and life of the study.

The salvia with its scarlet blossom and fresh green leaves is an inspiring specimen to work from. Very simple brush strokes may be used to advantage in telling the character of the plant, especially the blossom. Notice in Fig. 1, Plate XVIII, the way the brush was used to represent the florets. Notice also the difference in direction of the florets obtained by placing the brush in different position.

The question, "Where shall we begin to paint such a flower as the salvia—with the blossom or with the stem and leaves?" is very often asked by teachers who are not experienced in flower painting. There is no iron-clad rule by which this question may be answered. Some teachers maintain that the blossom is the most important part of the study and should



Plates XVI and XVII.

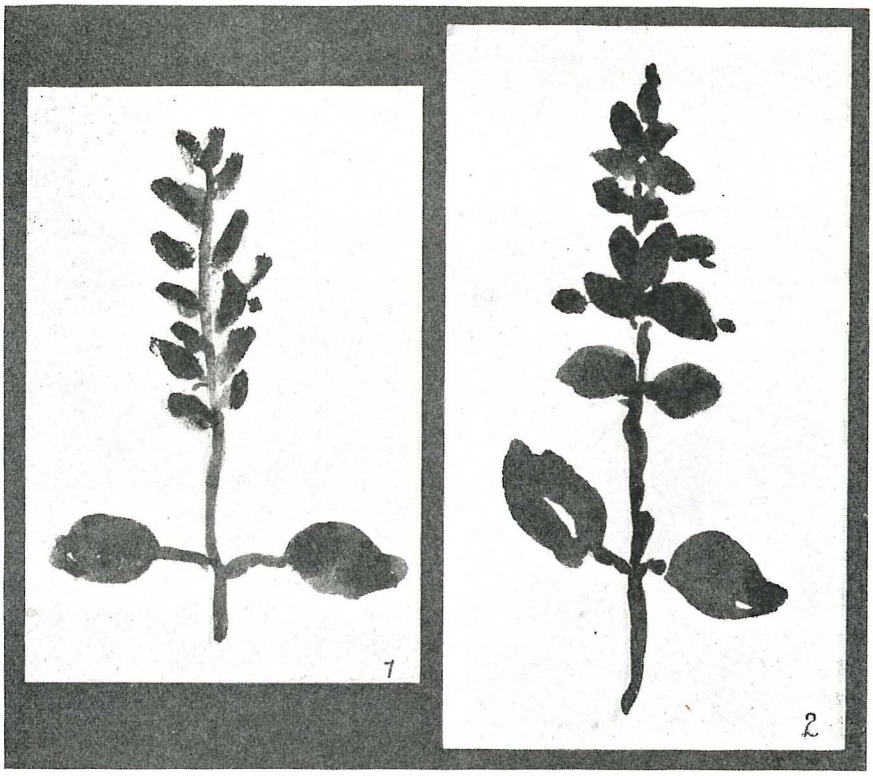


Plate XVIII.

be located first. There is considerable in this view of the matter when viewed from the standpoint of composition.

Young children find much pleasure in making the plant grow on paper much as it seems to have grown from the ground. When this plan is followed, the young painters seem to feel the necessity of looking at the model in their effort to make the plant grow as it should.

Fig. 2, Plate XVIII, shows salvia done in the way just now suggested. A specimen just about large enough to be painted actual size was chosen for the model. The children were asked to tell which part grew first—which leaves were large—why they were large—why some of the leaves at the top were smaller than others, etc. The same suggestions concerning the florets were developed. In this way the children were induced to see and understand the law of growth in the specimen.

When the children were ready to paint they were asked to show with their brushes on paper how far the stem grew before it sent out leaves. There was a difference in the directions in which the opposite leaves grew and the children were asked to show this difference. Then they were asked to show how far the stem grew before it sent out the younger leaves. They were asked to show with their brushes that these leaves were younger than those first painted. Among the autumn plants which furnish good material for development in painting are to be found the wild sunflower, the flowering bean with its purple pods, the wild aster, rose hips and leaves, and sprigs of sumac.

After this work in mixing colors in the brush and leaf and stem formation have been developed more interesting work may be done with fruits and vegetables. Bits of the stems and leaves may be left attached to the fruits. In arranging such models care should be taken to see that the leaves do not fall down over the fruit. If they are forced back so that they are seen apart from the fruit, the representation will be made much easier and the results will be better.

The little spots of the color of the paper separating the different parts of the model are very effective here in helping to keep the color spots where they should stay.

Figs. 1, 2, 3, 4, Plate XIX, show samples of work done by first grade children. Figs. 5, 6 and 7 show work produced in second and third grades.

HELP IN CHECKING UP THE CLASS, THE ROOM AND THE TEACHER

Rodney S. Brace, Homestead, Pa.

MANY of our best superintendents, especially in the smaller communities, find it difficult to know how to regard the handcraft and drawing classes. They can apply the usual procedure in regard to the room, the discipline of the class, the teacher's appearance and attitude; but, when it is necessary to consider the class and the work it is doing, they are at loss. The more nearly the handwork teacher is able to approximate Froebel's principle of self-activity, the harder is the work of the superintendent. The condition of democracy and social freedom which it is possible to gain in these classes is so easily confused with disorder and undirected work that a decision is, sometimes, very difficult.

It was a condition of this kind which brought about the following outline which has found a number of uses. The superintendent may use it as an addition to the parts of his usual procedure which apply to the arts classes and substitute it for the parts which do not apply. The supervisor will find his own ideas here, perhaps newly expressed, and will discover that teachers respond with enthusiasm to a discussion of methods of supervising their own work. For the class teacher there is the opportunity of getting the supervisor's point of view toward the teacher's work.

Detail has been purposely cast aside in favor of the greater advantage of an outline with a few valuable points easily remembered. Almost all considerations of general teaching and school work have been left out.

What are the important things to consider in visiting this class in a handwork subject?

A. In regard to the classroom, laboratory or shop?

1. Are the benches, machines, etc., arranged to the best advantage for all concerned?
2. Is the impression from the room one of neatness and order?
3. Are the places for the tools so arranged that the tools can be easily taken out, put back and inspected?
4. Is the main idea conveyed, one of accuracy?

B. In regard to the class in general?

1. Is every pupil intent upon something connected with the project at which he is working?
2. Do the pupils have places and keep them or do they go up to the teacher, follow him about, etc.?
3. Is the class able to take the responsibility for general neatness, order of tools, etc., or is it necessary for the teacher to look after all the details?
4. Is a care for accurate action apparent?

C. In regard to the individual pupil?

1. Does each pupil know what he is making and comprehend it?
2. Can he choose the proper tools and use them?
3. Is he familiar enough with each tool to treat it as an acquaintance?
4. Is his regard for the materials workmanlike and conservative?
5. Is accuracy his aim?

D. In regard to the ability of the teacher?

1. Has he chosen a project hard enough but not too hard for the class?
2. Are the pupils interested in the project and, if not, why not?
3. Is his work organized?
4. Can he teach accuracy?

There are few classes with faithful teachers which can not be models of success if the teacher brings his best to bear along each of these lines of approach.

"It has become indisputably clear to me how much more truly a person is moulded thru that which he does than that which he hears."—*Pestalozzi.*

INDUSTRIAL-ARTS MAGAZINE

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EDITORIAL

RABID EDITORIALS.

EXTREME speech is most often the result of ignorance or passion. With the speech maker before us we can often recognize the bias which ignorance or passion gives speech and discount the statements as fast as they are uttered. Editorial bias is not so readily recognized. It is seen in cold type and we accept it as the well considered opinion of the writer.

At a recent meeting of American editors the modest opinion was expressed that editorial influence on public opinion was second only to the influence of ministers of the gospel. We are inclined to the belief that America's free press is second to no influence in the formulation of public opinion in America. To be sure we have learned to discount the headlines of our daily papers, but when overstatements appear in the editorials of our papers and magazines we are inclined to accept them as authentic until we learn better by experience.

Two such overstatements with regard to art instruction in the schools come to our attention. In one of these the editor of an educational magazine ends a tirade against the use of prints of historical art with the statement, "The Sistine Madonna has been as ruinous to sincerely American artistic development as any other one factor."

In the second of these rabid editorials a writer who urges more direct and "practical" study of art tells us that "The invention of the printing press was a great misfortune to the cause of education." *The Industrial-Arts Magazine* represents particularly that type of instruction which is supplemented by handwork, yet we are convinced that the making of things in school without reference to the masterwork of the past and without relative study is not the best instruction.

Education is the development of mental power and teaching is the process for such development. We are of the opinion that teachers of the manual arts need a wider outlook than is afforded by the practice of a trade. Teaching is a profession with definite and established methods of operation leading to definite results. The fact that in the manual arts the shop product is often mistaken for educational result has misled manual art teachers to the opinion that material product is the measure of successful instruction. Power of mind is developed by the consideration of cause and effect. A good teacher cannot be blind to historical achievement and historical achievement is represented by examples and books. It is of course not enough to learn the facts of history. It is not even enough to study immediate cause and effect in history. We heard a popular speaker recently assert that "The premises and conclusions of history do not apply to our modern conditions." This is true in many cases but it is only equivalent to saying that humanity has always been subject to error and we may not accept historical results as suitable to modern conditions in all cases. Modern success is based upon past failures as well as upon past successes. We must learn of the past and adapt our knowledge to modern conditions, for history does repeat itself as surely as effect follows cause.

The Sistine Madonna is the personification of faith, hope and love embodied in Christianity. Can it be possible that this great picture has been ruinous to American artistic development? Even incidental observation of a picture that is altogether good could hardly be detrimental.

If such a picture as the Sistine Madonna has been detrimental it has been so by the inverse logic which makes pins save lives by not being swallowed. The great masters have been detrimental to American art by our neglect of them. Any one who observes art instruction in America finds that historical art has not been over-studied, however much American artistic development has been retarded.

As for the invention of the printing press being "A great misfortune to education," we would rather pronounce it the greatest blessing to education. Of course this radical statement was made under the contention for more study of objects of art in place of so much study of books. We believe that with the abundance of books and the study of them there has never been a time in history when study has been carried on in so many different lines and by so large a proportion of the people working directly with actual materials.

In America as elsewhere, the study of the humanities as represented by texts has had difficulty in holding a relative place with the study of the sciences as represented by laboratory methods. The content of much of our manual art instruction has not yet been formulated for publication. When books have been written and published covering the subjects of instruction in the manual arts with pedagogical as well as technical understanding, the work may become standardized and much more effective. We do not need fewer masterpieces or books but more thoro study of both supplemented by work in the Industrial Arts.

A SUGGESTION TO OUR CONTRIBUTORS.

THE editors of the *Industrial-Arts Magazine* have a long list of acceptable articles for publication in hand.

This material is on many different subjects and has come from many experienced teachers of the manual arts.

A comparatively small part of the material is theoretical. Most of it is acceptable because it describes manual work that has been carefully and well done in school classes.

Some articles have been rejected because they were not well written and some because they were not relevant.

Many articles have been rejected because they have not been well illustrated. It should be assumed that a teacher of manual work can draw and letter well.

The drawings and dimensions should be clear, accurate and composed for reproduction. When reproduced the drawings should explain the construction thoroly and every letter and figure should be legible.

Photographs for reproduction must be clear and contrasting in tone.

In this day of much publication every teacher of the manual arts should give attention to the presentation of ideas thru the printed page.

Let us have better drawing.

RAISING THE COMPULSORY SCHOOL AGE.

ONE cannot view thoughtfully the tendency of present day legislation without being impressed with the fact that child labor cannot exist many more years in the United States. The compulsory school age is being raised to 16 in a number of states, and in others school attendance for from five to eight hours a week is required between the ages of 14 and 16. In at least one state attendance in continuation schools is required until the age of 17.

All the evidence points toward a more general acceptance of the principle that the minor is the ward of the state and as such entitled to the guardianship of the state. The principle is universally recognized in considering the legal status of the minor—his protection as a minor heir, or right of contract.

When the principle is fully recognized and an adequate effort made to prepare *every* child for happiness and efficiency then we may hope for true democracy in education. One of the incomprehensible things will then be that we ever considered the five or six-hour-a-week continuation school for 14 to 16-year-old children to be anything but a temporary institution.

APPRENTICES AND MIXED CASES.

RECENTLY, announcements have been made by a number of large printing concerns that they have dismissed their apprentices, melted down their type, and done away with hand composition in their shops.

What was the matter? Dirty cases. It is charged by the officials that in the handling and distribution of the type, the cases were so frightfully mixed that the time, labor, and annoyance entailed by such condition made such work unprofitable and undesirable.

It is extremely interesting to note in this connection that often the very people who allege such conditions in their own business are loudest in their contention that "the commercial shop is the only place to learn printing." We are not taking issue with the contention here, we simply point out the inconsistency.

If the charges made against the printers in these commercial establishments were in any large measure true of the *school* printers, how soon the shafts of criticism would be directed toward the "inefficient and impractical *school* printers."

A very large per cent of the printing teachers in the schools have been selected from the printing trade. In addition to being good printers, they are also good teachers by natural aptitude or training or both.

School people should be as familiar as possible with trade conditions and methods. Likewise, people in the trades would do well indeed to familiarize themselves with what is going on in the schools.

SOLICITING EXHIBITS.

COMPLAINTS are occasionally made by commercial people concerning certain attitudes and practices on the part of school people.

It is claimed, for one thing, that advantage is sometimes taken of the willingness of commercial concerns to furnish samples or exhibits of tools and materials to schools. In some cases, it is said, expensive exhibits are secured by teachers with no other thought than that of adding to their collection of things of industrial significance.

We feel that in their dealings with commercial firms, teachers should be extremely careful not to enter into any obligations that would in any way embarrass or hamper the best interests of the schools. Neither should they solicit exhibits of tools or materials which they cannot conscientiously use in their own work and recommend to others.

Teachers should recognize that exhibits are furnished by commercial concerns frankly as a means of advertising, in the hope of increasing their returns. Our experience leads us to believe that most firms are willing to rest their case on the merits of their goods, and that they simply ask fair treatment and an equal chance with their competitors.

It would seem unfair, therefore, to solicit exhibits when their use cannot reasonably be expected to further the legitimate interests of both the school and the people who furnish the goods.

VOCATIONAL EDUCATION AND PRACTICAL ARTS AT THE N. E. A.

Art instruction in general and professional art in particular occupied much of the attention of the Department of Vocational Education and Practical Arts of the National Education Association during the convention in New York City, July 3-8. The department held five sessions and was tendered a reception at the Washington Irving High School. Some significant extracts from papers read before the department and before the general sessions of the association are printed below.

The Department was treated during the week to a series of conducted tours thru the leading art galleries of the city and thru the shops and art rooms of the trade, high and elementary schools. Splendid comprehensive exhibits of the manual training and household arts departments were shown.

The Department elected the following officers:

President, William J. Bogan, Principal, Lane Technical High School, Chicago, Ill.; First Vice-President, Ellsworth Woodward, Director, Tulane University, New Orleans, La.; Second Vice-President, Isabel Bevier, Professor of Household Science, University of Illinois, Urbana, Ill.; Secretary, Anna Hedges Talbot, State Department of Education, Albany, N. Y.

INDUSTRIAL EDUCATION.

William C. Redfield, Secretary of Commerce,
Washington, D. C.

In speaking upon the theme assigned me of Vocational Education, I trust it will be clear from the first that neither in thought nor word is there to be employed or spoken anything that fails to do honor to the spirit, the purpose and the work of academic education.

Here are not two opposing ideals but one common purpose. Here are two shoots springing from a common root. Here are two branches of the one tree. Here is not enmity but appreciation. Here is no opposition but rather support. The trained mind is well and because it is well it is also well that that trained mind should guide a trained hand. The trained hand thru a mind trained to grasp the things with which the hand must deal and to understand them shall be thru that mind a more effective hand. So there shall show in work the joint product of the training of the mind and of the hand until the whole man or woman shall be expressed in terms of that fine and fruitful service which is the giving of one's best to making the world better by their productiveness and which so approaches worship. If it be the spirit of academic education to preserve for the future ages the riches of all the ages past, it is the high ideal of vocational education to absorb the fruit of the ages and to fertilize the field of labor so that each successive age shall produce more and more that which shall bless the age yet to come.

One of the great phrases of the great Book is that which says "Take heed how ye hear." The cry of the children did not end with Mrs. Browning's beautiful poem. It has but changed its key. It is not true, as then it was, that the physical form of childhood is crushed in the mine. More and more that hateful thing—child labor—has become intolerable. Childhood and labor are opposing things that should have nought in common and it is almost sacrilege to place even in thought the burden of labor on the back of a child. There are two reasons why this is cruel. One is that the child is unable because he is only a child and the other is that the child is unable because he is unprepared. It is our belief that no true efficiency lies that way but rather that the youthful years in which mind and hand respond more readily than they ever thereafter will should be the time in which the child should be taught, among other needed things, how he may best fit himself for the day of labor when it shall come so that he may carry that burden more easily, more productively, with more of peace and less of pain, and shall become a man to whom productive work shall be a joy. The cry of the children today is, teach us to work and to know why we work as we do and how to work well and effectively. Vocational education then has no narrow horizon. The whole broad field of knowledge is its own. It does not seek merely to train the boy or girl for the mill. It is not long since a good Divine in whose church this subject was under discussion thought best in introducing me to warn the people against fads in education. He seemed to think that the advocates of industrial and vocational training were the antagonists of the common school, that they had some bizarre ideas of an iconoclastic sort, and meant to supplant culture in all its forms with a militant system of training in toil. I remember having to revise my speech on the moment to set the good man right and to make it clear to him that we did not intend a broadly leveling process by means of which a sort of intellectual conscription was to take place regardless of aptitude, environment or opportunity. I take it a boy in a soap works, a brewery or a benzol plant would not be harmed by knowing the chemistry of his business. Indeed you will remember the ancient rhyme,

Little Johnny went to Heaven,
We ne'er shall see him more.
What he took for H_2O
Was H_2SO_4.

The apprentice in a machine shop will be none the worse but rather the better for a knowledge of metals and the principles of mechanics. If he builds or repairs automobile engines something about hydro-carbons will do him no harm. The truth is that industry today reaches out into all the sciences so fast and far that the field for thought is large and free and fascinating and the inspiration of intelligent effort is an incentive to larger living.

Vocational education, therefore, is the opponent of things narrow and cramping. It looks with impatience on the boy in the machine shop who knows how to run a drill press but to whom the planer, the shaper and other machines are sealed books. It would take a boy and make him a mechanic knowing the why and the wherefore of mechanics, the reasons why each tool does what it does as well as understanding the way in which it does it. It would open to a boy and girl the recesses of knowledge out of which modern industry has sprung and on which it depends. It would make them reasoning workers and not automata. Its purpose is to make men and women flexible in their working powers and to take the rigidity out of toil. It is a human force, sympathetic and virile, leading the mind to express thru the hand the character and spirit of the worker.

It is sad to think how narrow the margin of safety is for many of our workers. How straight the groove in which as things now are they needs must run. A slight change of the industrial currents leaves many like driftwood by the stream since they have not been taught to swim in the industrial flood, but merely to float, as it were, with its current.

Vocational education has a high social function in that it does enlarge the factor of safety in human life. It makes it just so much the harder for the wolf to reach the door. It puts the presence of poverty so many paces farther off. I have often thought of the joy that will come when vocational education shall have wrought its perfect work in the form of certitude to many a humble home. No one familiar with factory life and gifted with the least imagination but knows the daily recurring tragedy in our industrial centers when the job is over and the man out of work hunts for employment while wife and children wait and worry. We do not offer vocational education as a panacea, but certainly the man who can and who knows why he can has an infinitely finer chance in life for the steady job than he who has never had the opportunity to know why he toils as he does and who has learned the way of his toiling without teaching and without sympathetic leading.

First and foremost, then, among the things to be gained by vocational education I should put its human value, the bringing of a greater symmetry to life. It is the motto "safety first" wrought into the fabric of the artisan's home. Second among its values I should put the bringing of power to industry. Too much our factories have been run as schools operated in their productive processes by masses of untaught. Too much has the time of foreman and superintendent been given to work of instruction instead of to leading production. Peace and prosperity would indeed be within our palaces of industry if it shall come to pass that within each great mill all workers know their work. Consider the value to a great department store of a whole force of clerks trained in salesmanship. Consider the value to a great mechanical industry of a working force in which each unit did with reason and intelligence the work to which his hand were set. Behold under such conditions how waste goes out at the door and with her the rule of thumb and all things born in ignorance. Consider the peace and power of the manufacturer in whose works blunders of ignorance are not committed. It would be almost a millennium to think of a great mill in which every worker was well trained in his or her work. This fine result of industrial training has not only human and industrial values but international ones as well. Our country is in the world's arena and it cannot retire from it. Your prosperity and mine and the wages of our workers more and more depend upon what we call our competing power and every boy and girl in every mill who has had no chance to learn and who, therefore, does not know the why and wherefore of his or her work is a missing tooth in the gears by which our industries revolve. It makes one proud and confident to think of America facing the world in the peaceful conquests of industry supported by trained and intelligent workers in all our mills and factories. It makes one rather sad to think of America trying to meet the world in competition unless and until her workers shall have had a chance at that education which has heretofore been denied them. Of infinite value are our boys and girls but we have not made the best of their values heretofore. Most of us need work but few of us have ever been taught to work and work therefore has been harder, less productive and less remunerative than it would have been had we done more wisely. We have seen a great light these recent years and have learned that the means whereby we live are well worth studying and teaching that we may live better and with less care.

So it shall come to pass, to use again the words of the ancient Book, "the crooked shall be made straight and the rough places plain," and toil shall be easier for the toiler and more productive for him too and more remunerative to the captain who leads toilers, and there shall be more safety all round and greater power and much more peace when that which we call vocational education has done its part.

ART TRAINING FOR THE TRADES.

"In the tremendous growth in industry which this nation has experienced, the need of the expert artisan has become insistent. Of industrial education we hear much, but of industrial art education little. This is because we are an industrial nation without an industrial art.

"We import from abroad manufactured products in immense quantities that sell in our home markets because of the choiceness of their colors and designs. This is because we cannot compete, as yet, on even terms with foreign manufacturers for we have not taken steps to develop our own designers. We go abroad for styles and turn ourselves into a nation of copyists.

"Europe has shown us that an industrial art system cannot be built in a day. It is the result of years of patient study and state support. We have trusted to a 'laissez faire' method and have waited for demand to create supply. But art schools cannot be so developed, and meanwhile we have paid, and will still pay, large sums to the foreign manufacturers in states that have seen to it that every talented boy or girl was given state aid in the development of their talent.

"A great system of industrial art education in this country is an essential step in economic preparedness. Teachers must be trained for this work. Trades must be studied by these teachers, so that trade needs and standards can be met in the classroom. Manufacturers must be interested so that they become aware of the wealth of home talent which is available—and above all, this talent in the classrooms must be sifted out from the great mass, the ungifted, and then fostered and trained that it be brought to its highest efficiency. This is not a local question but a national one. In industrial art lines we are behind, we are short-sighted, and need a thoro rousing to our economic myopia.

"New York City has in part sought to aid in the solution of this problem thru the development of an industrial art high school course for girls. This in time will doubtless be followed by a similar course for boys. The Washington Irving High School has with its art classes for girls formed an experiment station of first importance to the country at large. Its findings are of value to every large city and to many a small one.

"Thru the development of these art courses it has come to be seen that the teachers for this work must be specially trained. They must know the trade. During the past year the art teachers of this school visited over one thousand manufacturers to consult with these men and their designers. This has brought the school into touch with trade conditions as nothing else could have done.

"The essentials of the best forms of trade teaching have thus been made plain, and the lessons learned have been found to be precisely those learned by foreign teachers in foreign art schools. First, that sound instruction in drawing is fundamental. Pupils must draw and redraw until their minds are habituated to fine movements and delicate gradations of line. Next they must learn to design directly from nature. They must work in color and be trained to original performance. Any other practice makes them copyists who can never rise to the first rank. With their work in design they must be taught to use color thru endless experimentation. Little color theory is needed, but abundance of practice.

"Of great importance also is the discipline the school should give. The student must learn to work with absolute accuracy, to be critical of their own mistakes, and to be punctilious in the completion of work promised for delivery at a certain hour. These are virtues imperative in the trade. With their fundamental training done, they must specialize, not so much in the line of their likes as their talent. If they have an aptness in costume work, then this they should do, for along these lines their chances of advancement are best. When so prepared it has been found no student need seek for a position on leaving school. The last class graduated was absorbed by the trade within a fortnight. For the well-prepared there is no waiting."—*Dr. James P. Haney, New York, N. Y.*

ART A VITALIZING FORCE IN EDUCATION.

Art is still by too many regarded as superfluous. Yet there never was a time when art was not. Every step in evolution is recorded in some form of art. Art is the measure of civilization.

A comparison of the Greek, mediaeval and renaissance art expression with our own, shows that our own fails to measure up. There are several reasons: stern Puritan traditions, material development, mechanical inventions and processes which substitute quantity for quality, art inheritance making imitation too easy, superabundance of ways and means that deaden taste, complex conditions in politics, religion and society that bewilder and confuse.

Tho the United States is said to be inartistic, there are many evidences of an awakening consciousness to the need of the spiritual element furnished by art. Growth in this direction is marked by the world's fairs. Movements towards civic betterment, village improvement and rural development, the building of art museums, the organizing of art associations, denote activity along these lines.

The economic value of art in our industries, the call for it in the trades, the need of it in the life of the people, demand a more universal presentation of opportunities for art expression in the daily life of school children.

Teachers of the manual arts and home economics are especially privileged, because in their work, aesthetic expression is by means of the common objects used in everyday life. The teacher is the vital element.—*Annette J. Walker, Cornell University.*

ART IN HOME ENVIRONMENT.

Art in the Home Environment means the bringing about of harmonious relations between the various elements involved in home making:

(1) Between the house and its neighborhood—the region, the other houses in the vicinity. It should fit.

(2) Between the house and its lot. It should seem happily wedded to the land.

(3) Between the interior color schemes and the lighting. Each room should have an appropriate and pleasing complexion.

(4) Between the furnishings and the structural areas. Everything should seem to belong just where it is placed.

(5) Between the decorative accessories and the room as a whole. Pictures, objects of beauty, floral decorations, should enhance the beauty of the color scheme.

(6) Between the home and its inhabitants. The home should reflect personality. It should seem to belong in an intimate way to those who live in it. Individuality should be evident in such elements as the minor decorative objects, house or hall marks, bookplates, stationery, embroidery, jewelry, etc.

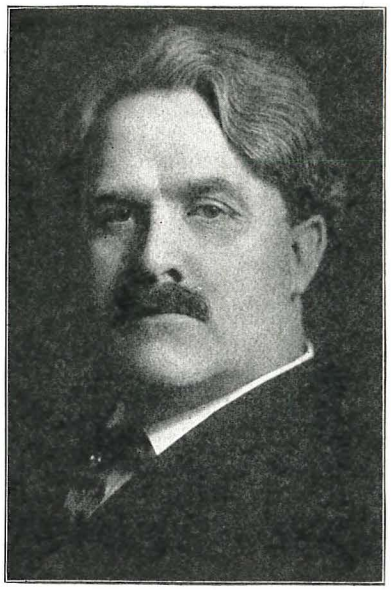
(7) Between the home life and the world life. The changes of the seasons, the dominant interests of members of the family group, and their changing recreations, if reflected in the home, will add to its effectiveness as an uplifting and gratifying agency in personal and civic life.—*Henry Turner Bailey, Editor, School Arts Magazine.*

ART EDUCATION AND INDUSTRIAL RESULTS.

"American art education, as it relates to industrial production and to the utilization of industrial products, has not yet learned of the arrival of the twentieth century. In imagination it still lives in the age of handicraft productions; its blinking eyes refuse to see the overwhelming presence everywhere of machine production. Schools of art education maneuvre themselves into control of our handwork training in elementary and secondary schools, and give us a bewildering output (in the name of the industrial arts, forsooth!) of unsubstantial wooden toys and notions, fantastic beaten brass work, weird ceramics, and curious basketry. They send forth large numbers of nice graduates, many of whom have vague notions that the world of industry will at once welcome them as designers of furniture, jewelry and gowns. Industry takes up some of them and gives them distinguished place in time, it is true, but not so much because of their training as because these persons, having talent and ambition, have entered and sojourned in the art schools for a season on their way.

"There are great opportunities ahead for education in the applied arts in America if the special schools devoted to this field define, delimit and differentiate their purposes. They must set competent committees at work to answer in detail and with evidence, the questions: What is an art school for? What can it do for the education of the rank and file? What can it do for talented individuals who are capable of rendering special service to industry?

"First we must see to it that education in applied arts for the multitude of our children shall teach them how to choose the products of industries of our time which they will approve and buy and use. All our people buy garments, illustrated papers, china, ornaments for the person, and decorative bric-a-brac. All buy or rent furniture, rugs, yards, and vehicles. Very many patronize moving picture shows, theatres, places of outdoor recreation, and museums. In all these relations they are almost constantly making choices, based upon their standards of intelligence and taste as to things efficient, durable, hygienic, artistic, economical. Have we prepared them to make good choices, to be intelligent consumers, to use wisely? It is the largest function of art education to contribute, as one of the agencies of liberal education, to this end. We are hardly doing this yet, largely because we refuse clearly to define the end concretely. We are afraid to get down to 'brass tacks' in art education." —*David Snedden, Professor of Educational Sociology, Columbia University.*



MR. WILLIAM J. BOGAN,
Chicago, Ill.
President-elect, Department of Vocational Education and Practical Arts, National Education Association.

THE ART INSTINCT UNIVERSAL.

The prevailing impression that art instinct is possessed by only the talented few is slowly disappearing.

Art must be used to grow, and there must be art environment for its fullest development.

There is no soul so dead but in it is a spark, at least, of art feeling. The wish to see beauty, to create or own it is manifested in many ways. It may be in the enjoyment of good pictures, a well-planned garden, fine furniture, dress, a beautiful home.

The art instinct is placed in the soul of every one by an all-wise Creator. Is it not for enjoyment, uplift, a stimulus for greater effort and excellence?

Some educators have recently been emphasizing the teaching of art in the schools for appreciation only; that people may buy judiciously. In contrast, consider Germany and other European countries where pupils showing ability in the arts are carefully educated by the government and at its expense, if necessary. It is considered a splendid investment.

They are educating producers—we are buying their products.

Is it not best to emphasize marked tendencies?

Oh! what a waste there has been of material of incomparable value to the individual and to the nation!—*Florence E. Ellis, formerly Supervisor of Art, Cleveland, Ohio.*

A vocational survey of Indianapolis has been begun by Mr. Charles H. Winslow of New York. The survey, which will include every line of work in the city, will enlist the cooperation of local organizations and manufacturers. It is expected that at least forty experts will work directly under Mr. Winslow.

The survey will include a tabulation of the work done by men and women in the city, together with expressions of opinion as to how a further education may benefit them.

PROBLEMS AND PROJECTS

The Department of Problems and Projects, which is a regular feature of the INDUSTRIAL-ARTS MAGAZINE, aims to present each month a wide variety of class and shop projects in the Industrial Arts.

Readers are invited to submit successful problems and projects.

A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing and a good photograph. The originals of the problems in drawing, design, etc., should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are eligible for consideration.

The monthly award of a prize has been suspended for the months of August and September.

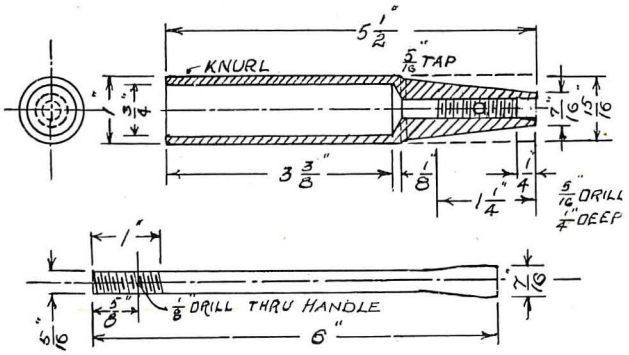
Drawings and manuscripts should be mailed flat and should be addressed:

The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

A SCREW-DRIVER WITH NON-SPLITTING HANDLE.

John H. Faust, Mt. Vernon, N. Y.

One of the tools in the school shop that does not last very long is a screw-driver. The wooden handle either splits, caused by hammering or other rough usage, or if forced too much will slip in the handle. There is nothing which discourages an instructor more than to see a lot of tools which have been misused and abused. The screw-driver is one of the tools which gets the worst of it, in that it is commonly mistaken for a chisel.



Details of Screw Driver.

The screw-drivers as shown in the accompanying picture and drawing are being made at the School of Industrial Arts, Mt. Vernon, N. Y. They are being used with great satisfaction and are found a good project for the beginner, affording good exercises for the following operations:

Handle.

1. Cutting off stock.
2. Centering.
3. Truing, but just cleaning up between centers.
4. Turning one end $\frac{1}{8}''$ less in diameter and 2″ long.
5. Knurling.
6. Drilling large hole $\frac{1}{4}''$ less in diameter than that of handle.
7. Drilling with tap drill thru the rest.
8. Rounding up end of handle to prevent injuring hand when in use.
9. Tapering end toward bit.
10. Drilling with body drill $\frac{1}{4}''$ deep from bit end. (This is done so as to set bit in deeper, preventing the thread from showing where joined.)
11. Tapping.

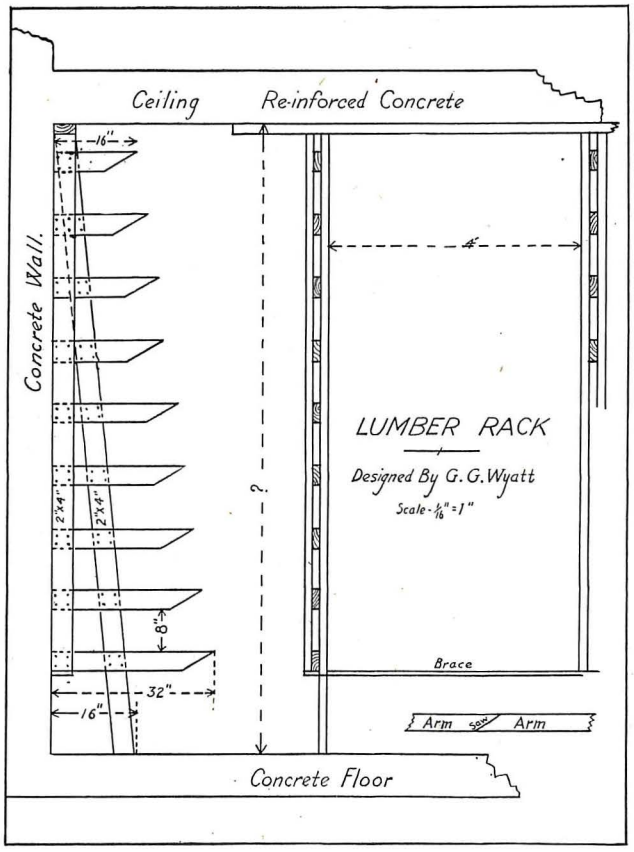
Bit.

1. Cutting stock.
2. Forging end to shape.
3. Grinding or filing to shape after forging.
4. Cutting thread on other end (1″ long).
5. Assembling.
6. Drilling $\frac{1}{8}''$-hole thru handle and bit.
7. Pinning.
8. Hardening.

LUMBER RACK.

G. G. Wyatt, Houston, Texas.

This lumber rack is explained in the adage, "Necessity is the mother of invention." The walls where I had to put it were concrete which prevented any way of nailing or reliable fastening for the load it had to carry. It is particularly adapted to this circumstance. The drawing ought to explain itself; its main principle is founded on the lever. The arms that hold the lumber act as a lever and the more lumber piled on them the tighter it pinches itself against the wall. The front leg is extended forward to prevent the rack from tipping forward.



Details of Lumber Rack.

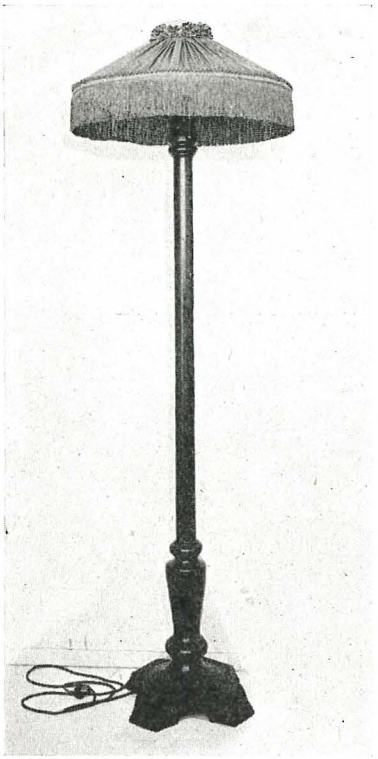
I have given this lumber rack a thoro test and it proves its stability. It will hold all the lumber that can be placed on it, with only a wooden floor and ceiling as supports; four posts are sufficient to support the lumber evenly.

PIANO LAMP.

Walter C. Roediger, Kalamazoo, Mich.

The following project illustrates the possibilities of correlation between applied design, mechanical drawing and shop work. The design for this piano lamp was worked out in the applied design class, the shop drawing, full size, in mechanical drawing and the construction in the wood turning shop. Projects of this nature afford excellent opportunities for combined wood machine and bench work and simple wiring.

Owing to limited capacities of lathes usually found in school shops, it will be necessary to use some kink to lengthen the bed of the lathe. The most satisfactory arrangement known to the writer is that of butting two lathes end to end. By removing the tail stock from one lathe and using the other tail stock in the regular manner the distance between



The Completed Lamp.

Stock Bill.

Mahogany, Cherry or Walnut.

2 pcs.—2″x4″x48″
2 pcs.—$2\frac{1}{4}$″x5″x$15\frac{1}{2}$″
2 pcs.—$\frac{1}{2}$″x$2\frac{1}{4}$″x$15\frac{1}{2}$″
4 pcs.—2″x2″x9″
4 pcs.—$2\frac{1}{4}$″x8″x8″

centers will be doubled. By carefully planning the work any inconveniences caused by the loss of one lathe will be eliminated.

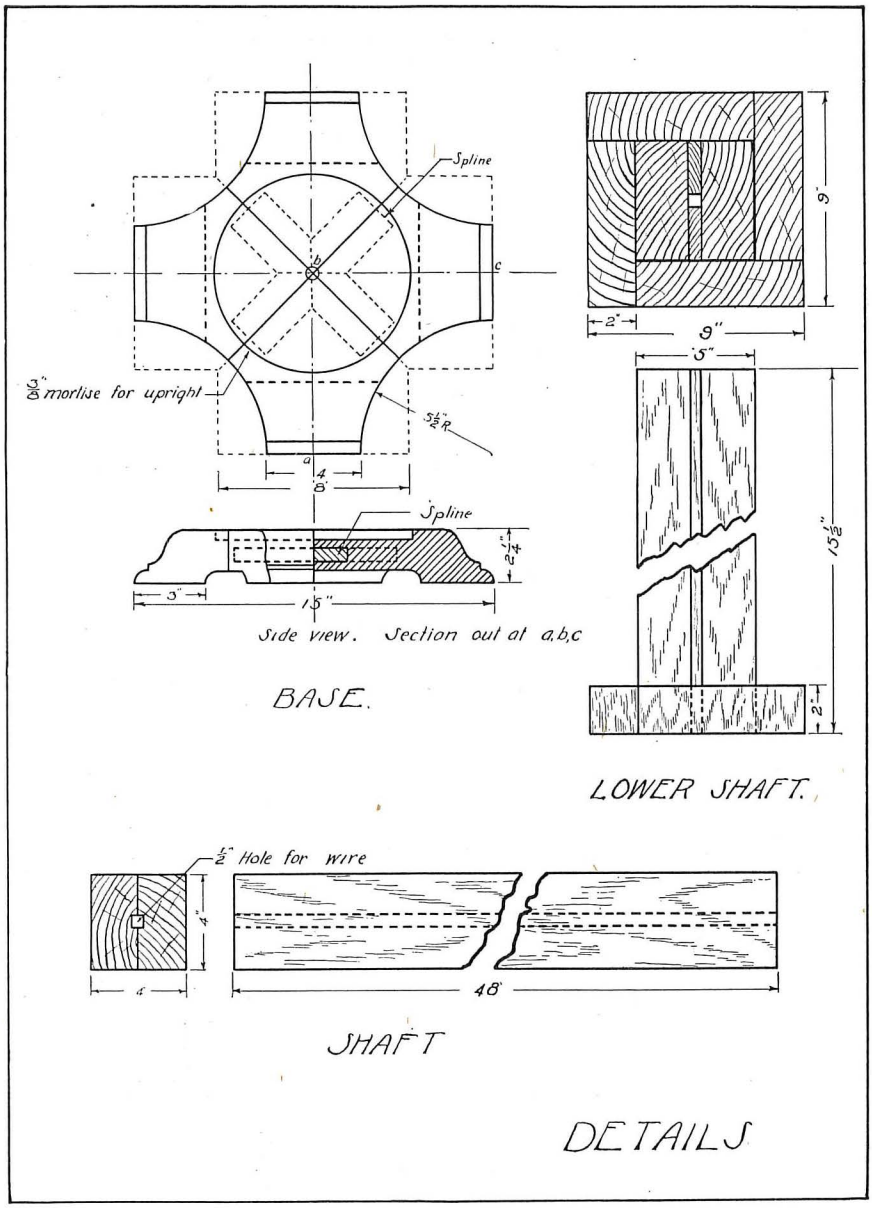
A well executed job of mill work is essential. Two pieces 2″x48″ are required for the upper shaft. Cut a groove $\frac{1}{4}$″x$\frac{1}{2}$″ on the jointed faces of each stick and glue up. The lower half of the upright is a built-up job; two pieces $2\frac{1}{4}$″x5″x$15\frac{1}{2}$″, two pieces $\frac{1}{2}$″x$2\frac{1}{4}$″x$15\frac{1}{2}$″ and four pieces (the grain running crosswise of the pieces) 2″x2″x9″. The method of gluing these up is best shown in the detail drawing.

Before turning the long shaft, plug the holes with hard wood plugs. Place the shaft in the lathe so that the lathe centers spot accurately in the plugged holes. In order to eliminate chattering while turning, run lathe at a slow speed.

True up the large end of the lower upright square with the $\frac{1}{2}$″ hole and fasten this on a large face plate, taking care that it is accurately centered. Rough out and turn a mortise to fit the tenon of the shaft and tenon to fit the recess in the base. If an oscillating movement is used in sanding, those rings so detrimental to a finished surface will be avoided.

The base is made up of four pieces $2\frac{1}{4}$″x8″x8″. Each piece is mitered and then grooved for a blind spline. Rough out on the band saw the feet of the pie shaped pieces and assemble. Pinch dogs may be used to draw the pieces together. Quarter circles are band sawed from each corner and the base is put on a face plate and a recess cut to receive the upright.

Precautions must be taken in gluing up the shaft to get it in alignment. Glue and screws are used to fasten the shaft and base together. Bore a $\frac{3}{8}$″ hole to receive a rubber bushing in the side of the base. The exact location of this hole is left to the individual.



Lamp Details. (See, also, next page.)

The lamp was finished with a regular piano finish. Five coats of rubbing varnish and one coat of polishing varnish were applied over two coats of stain, one coat of stained paste filler and one of white shellac. At least four days' time should be given between each coat of varnish for drying. Two-thirds of the total time for constructing the lamp should be spent in the finishing.

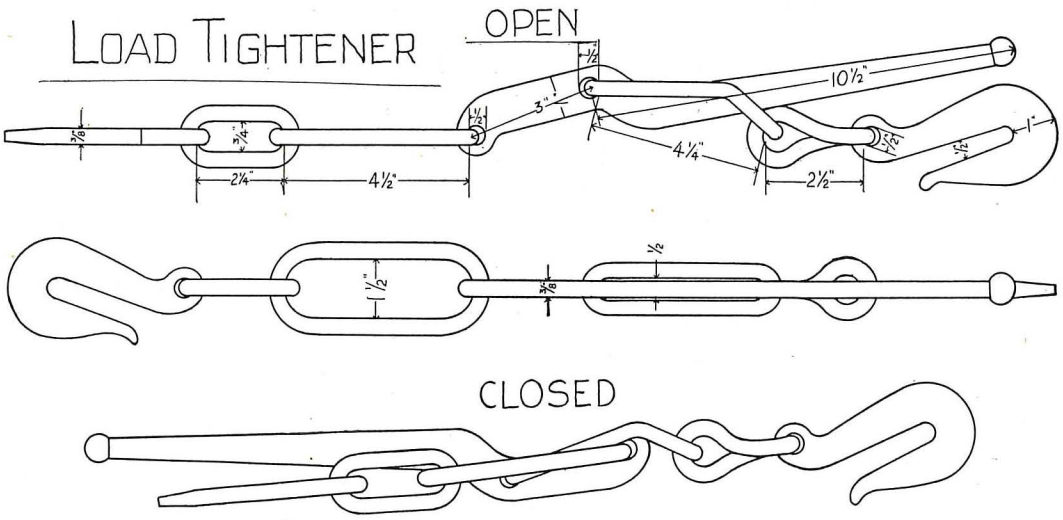
The electrical fixtures may be purchased and assembled by the student and the shade constructed in the applied art classes.

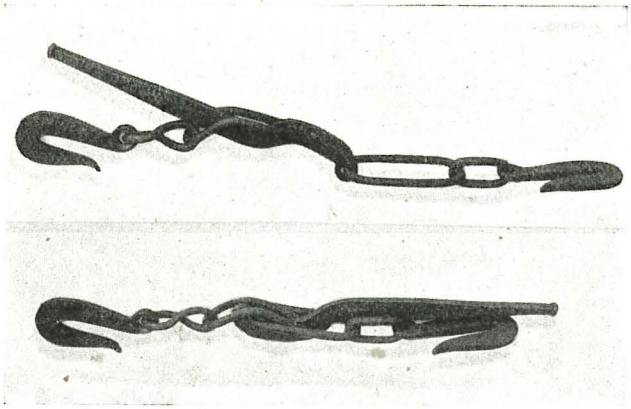
LOAD TIGHTENER.

Lee M. Klinefelter, Hesperus, Colo.

The load tightener shown was made by a boy in an Agricultural Forging class. He obtained his idea from a similar article shown in a mail order catalog, and made the piece with very little other assistance. It was later made by others in the class, and proved very popular, as it combined usefulness with a certain amount of mechanical action In other words, it was a machine, and not simply an exercise.

The design may be modified to suit needs but as shown seems to be of about uniform strength thruout. The handle is first shaped and holes punched, after which the hooks are forged and the short links welded on. The long links are then welded thru the short links and the eyes in the handle, after which they are shaped. It is impossible to more than





Top—Load Tightener Open.
Bottom—Load Tightener Closed.

roughly shape the narrow bent link until after it is welded on. The hooks may be any satisfactory style of grabhooks, and the link shown twisted need not be so, unless desired.

Soft steel should be used thruout, unless it is desired to simplify the welding by using Norway iron.

Stock.

All soft steel.

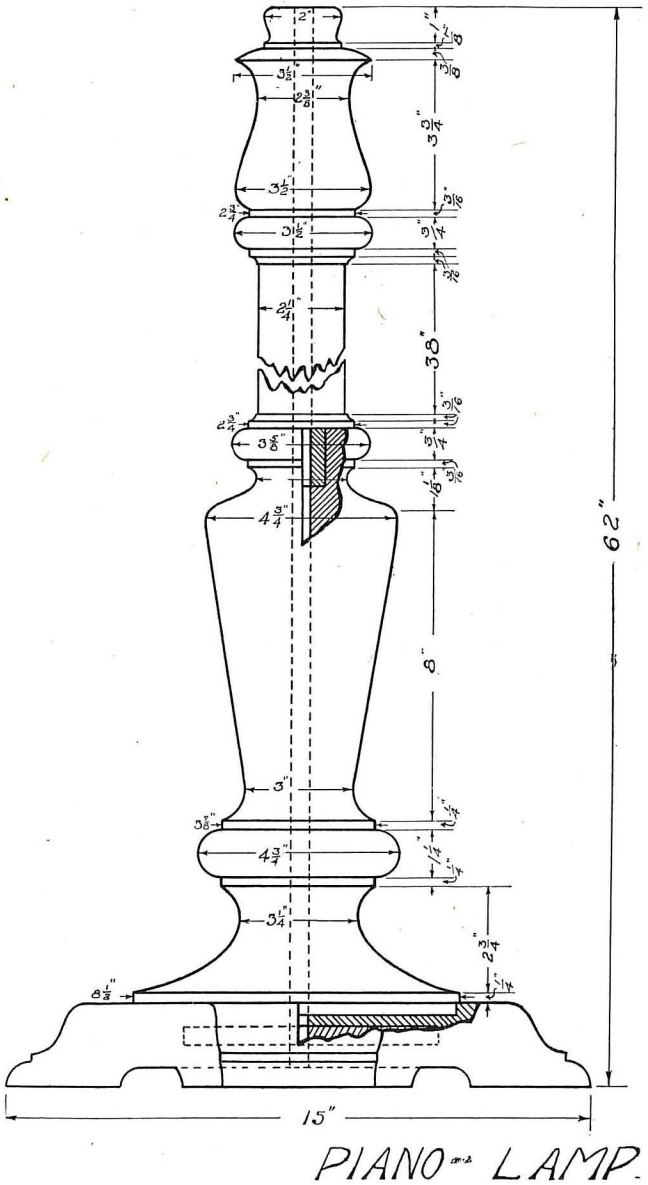
Hook, 1″x⅜″x8″
Short link, ⅜″x6″
Broad link ⅜″x11½″
Handle, 1″x⅜″x10″
Bent link, ⅜″x10″
Twisted link, ⅜″x6½″

SCREWS FOR WOOD.

Ralph F. Windoes, Davenport, Iowa.

Wood screws are common things— so common in shops that little attention is usually given them—especially their gauge number. If a boy asks for a two-inch screw, the teacher may give him gauge number 6 or gauge number 14, with little thought as to the proper diameter for the work at hand. He may also tell him to bore the hole in the first piece of wood with a quarter-inch bit—which is all right for the number 14, but much too large for the number 6. These little details should be given more attention, as they reflect themselves in the work turned out.

As a convenience in determining the proper bit size for the various screw diameters, the accompanying table has been prepared. In the first column is given the gauge number of the most commonly used screws, 5, 6, 7, 10, 12, 14, 16 and 18. The intermediate numbers have been left out as there are no twist bits or gimlets made that actually fit these sizes—unless square shank drills are purchased that are numbered in 64ths of an inch. This is not usually done



Turning Details of Lamp.

in woodworking shops as they cost much more than the twist bits or gimlets.

In the second column will be found the actual diameter, in decimals, of the wire—the part of the screw under the head and above the threads.

TABLE OF BIT SIZES FOR WOOD SCREWS

SCREW GAUGE	DIAMETER IN DECIM'S.	SIZE OF THE HOLE FOR WIRE	TWIST BIT OR GIMLET NO	SIZE OF HOLE FOR THREAD	TWIST BIT OR GIMLET NO.
5	.1236	1/8"	4	5/64"	
6	.1368	9/64"		3/32"	3
7	.1500	5/32"	5	1/8" HARDWOOD	4
				3/32" SOFTWOOD	3
10	.1894	3/16"	6	5/32" HARDWOOD	5
				1/8" SOFTWOOD	4
12	.2158	7/32"	7	3/16" HARDWOOD	6
				5/32" SOFTWOOD	5
14	.2421	1/4"	8	7/32" HARDWOOD	6
				5/32" SOFTWOOD	5
16	.2684	9/32"	9	7/32" HARDWOOD	7
				3/16" SOFTWOOD	6
18	.2947	5/16"	10	1/4" HARDWOOD	8
				7/32" SOFTWOOD	7

In the third column will be noticed the size of the hole required for the wire of the various diameters. The screw should just slip thru the hole without any driving, but should not be loose enough to rattle. In the fourth column will be found the twist bit or gimlet numbers for the preceding holes—these tools being numbered in 32nds of an inch.

The fifth column gives the size of holes needed for the thread of the screws to turn in—and in most cases hardwoods and softwoods require different sizes of holes for best results in driving and holding. The last column gives the corresponding bit numbers.

These figures have all been determined by actual trial, and have worked out very satisfactorily in every case. The two bit numbers that have been omitted in the table will require square shank twist drills numbered in 64ths of an inch.

It is suggested that the teacher make a large blueprint of the table to hang in the shop for quick reference.

For those who purchase wood screws, some additional information on them may be of interest.

Ordinary screws are made of iron, but screws are also made of brass, copper, bronze, and steel. Iron screws are finished bright, blued, galvanized, tinned, lacquered, and plated with any plating metal. The common head shapes are flat and round.

The gauge numbers range from 0 to 30, and the lengths from 1/4" to 6". Lengths vary by eighths of an inch up to 1", by quarters of an inch up to 3", and by halves up to 5."

Screws from 5/8" to 4 1/2" long are made in about sixteen different gauge numbers.

As the gauge numbers of wood screws increase, unlike the wire gauge, the diameter of the screw increases. For example, U. S. standard wire guage No. 1 is .2812, gauge No. 20 is .0375, while screw gauge No. 1 is .0170, and gauge No. 20 is .3210.

A PORCH SWING.

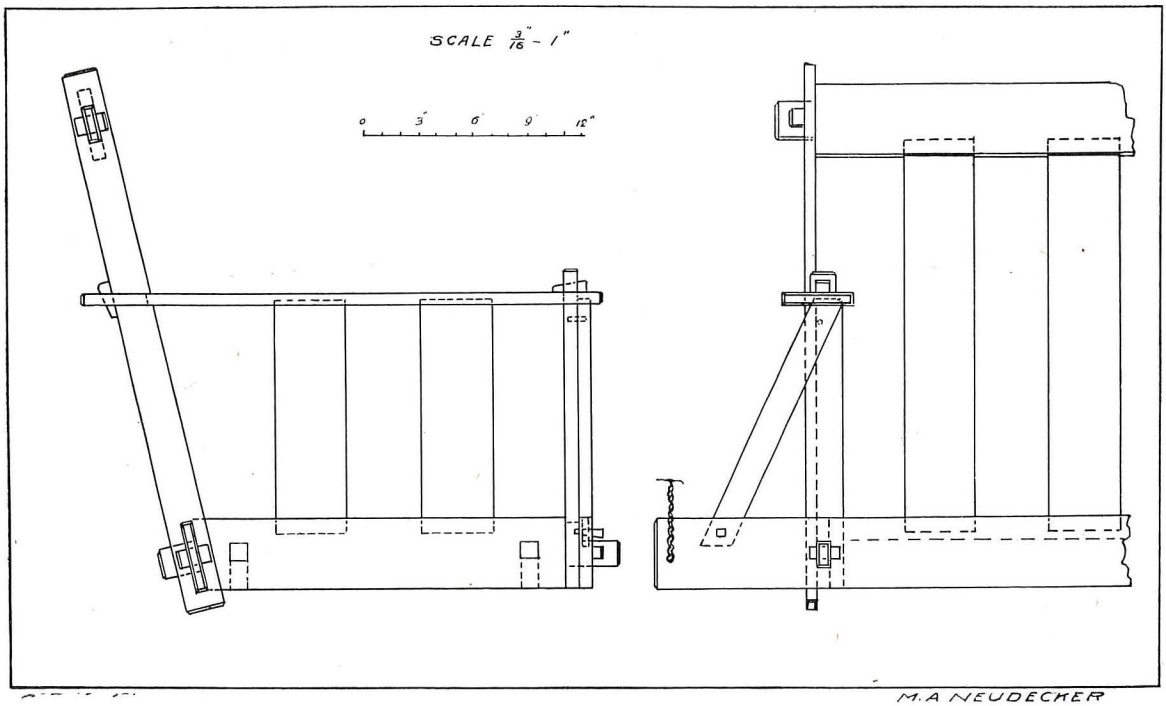
M. A. Neudecker, Jackson, Minn.

THE porch swing of which a drawing is printed on this page was made as a school project. It was designed to be completed without screws or bolts. Pins and keys were used in all the joints so that it might be taken apart and stored compactly during the winter.

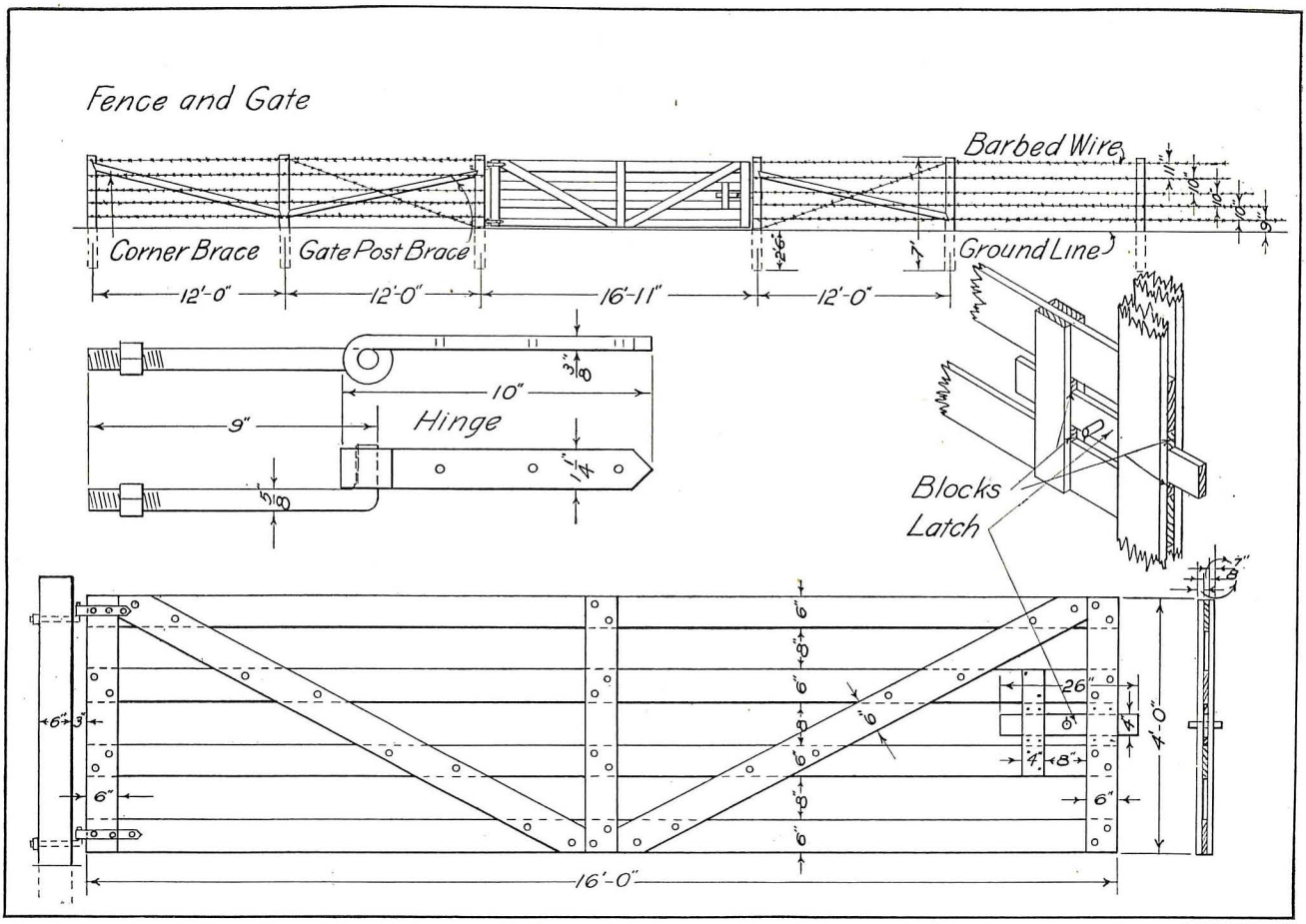
Plain white oak—no piece heavier than 7/8"—was the material used.

The extension of the lower front piece serves two purposes. The front chain is fastened to it and the footing for the brace to the arm rest is attached to it. This brace is necessary to overcome lateral pressure on the arm.

The original drawing provided that the boards of the seat proper be laid on two cross pieces mortised thru the lower end pieces. It was found, however, that the seat boards would be more secure, if strips 7/8" thick, were screwed to the lower front and back pieces.



DETAILS OF PORCH SWING.



FENCE AND GATE.

Louis M. Roehl, Wauwatosa, Wis.

Material Required.

Lumber:

5 pieces white or yellow pine $\frac{7}{8}$"x6"x16'0".
2 pieces white or yellow pine $\frac{7}{8}$"x6"x14'0"
1 piece white or yellow pine $\frac{7}{8}$"x4"x6'0".
1 piece round hardwood $\frac{5}{8}$"x6".

(Oregon pine or cypress may be substituted for white or yellow pine.)

Hardware:

2 pair screw hook and strap hinges.
26 carriage bolts $\frac{3}{8}$"x3".
16 carriage bolts $\frac{3}{8}$"x2".
23 6d common nails.

Stock Bill.

Pieces	Finished Dimensions	Use
4	$\frac{7}{8}$"x6"x16'0"	Horizontal pieces
6	$\frac{7}{8}$"x6"x4'0"	Vertical pieces
2	$\frac{7}{8}$"x6"x8'3"	Braces
2	$\frac{7}{8}$"x4"x20"	Uprights for latch
1	$\frac{3}{4}$"x4"x2'2"	Latch
2	$\frac{7}{8}$"x2"x4"	Blocks above and below latch
2	$\frac{7}{8}$"x2"x6"	Blocks above and below latch
1	$\frac{5}{8}$" round x 6" long	Knob.

Directions.

1. Reduce all pieces to finished dimensions.

2. Fasten the vertical pieces to the horizontal pieces by placing $\frac{3}{8}$"x3" carriage bolts at each joint.

3. Fasten the braces to the horizontal members by using two $\frac{3}{8}$"x2" carriage bolts at places indicated in the drawing.

4. Bore a $\frac{5}{8}$" hole in the center of the latch for the knob; place knob in position and fasten by driving a 6d nail into the upper edge of the latch so that the point of the nail will go into the knob.

5. Place latch in position.

6. Assemble the uprights for the latch to the two middle horizontal pieces 8" from the front end vertical piece by driving two 6d common nails at each end from each side.

7. In like manner fasten the blocks above and below the latch, as shown in the detail drawing, using two 6d nails from each side.

THE DOMAIN OF ART EDUCATION.

In common parlance art means painting and artist painter. This narrow conception has crept into our educational thinking, so that art education in public schools has come to mean drawing and color work, and the supervisor of drawing bears in many cities the title of "Director of Art Education." Conventions of drawing teachers assume the name of "Art Teachers' Associations."

The domain of art education includes all the fine arts and all the industrial arts. Of these at least four are now available in all progressive school systems. These are: Industrial arts and manual training; drawing, including color work and design; music, and literature.

Until recently only the second was represented in this department of the National Education Association. Recently the manual training teachers have been admitted. Music and literature have no recognition yet.

The problems of art education cannot be solved until teachers of drawing, teachers of manual training and of industrial art, teachers of music, and teachers of literature meet together in convention and each group makes its contribution towards the solution.

Such a convention has never been held. In many schools literature is not even recognized as art and not taught as such. We must broaden our conception of the scope of art education and realize the wealth of means and material now at our command.—*Thomas M. Balliet, Dean of the School of Pedagogy, New York University.*

Philadelphia, Pa. A summer school for teachers of vocational subjects was conducted recently in the Penn High School, under the direction of the State Bureau of Vocational Education. The course which included the principles and practices of instruction in vocational classes, drew about 75 teachers.

ITEMS OF CURRENT INTEREST

TIME ALLOWANCE FOR MANUAL ARTS IN PUBLIC SCHOOLS.

Report of a committee on "Time Allowance for the Manual Arts," submitted at the annual convention of the Eastern Arts Association, Springfield, Mass., April 20 to 22, 1916.

"In view of the criticisms directed against the subject of manual training, and in the absence of a definite and authoritative statement of the importance of and function of manual training and its relation to vocational guidance and vocational training, it seems a duty of this association to express its judgment on these matters.

General Statement.

"1. This nation is evidence of a great effort toward democracy in human affairs. The primary purpose of education in this country is conceded to be the preparation of individuals for citizenship in a democracy. The tendency of educational practices before the introduction of the manual arts was strongly against the democratization of education.

"2. Manual arts work in the schools, despite its meager time allowance, has been a distinct contribution to the development of the spirit of democracy in education. There is at present a definite recognition of the principle of equal opportunity for all in educational practice. With a mere pittance of the time of the school program the manual arts subjects may claim credit for having established workshops in schools, for creating in schools a place of interest and activity for thousands who otherwise would have found little of interest to them, for developing in other thousands an appreciation of the value of the fine and fundamental tools as well as an understanding of the wonderful mechanical processes by means of which man has mastered the forces of nature, for having maintained principles and practices of social service, and for having fostered the principles of co-operative effort in human affairs.

"3. It is freely admitted that some of the methods used in the past must be discarded. It is time for re-evaluation of practices in the light of new industrial and commercial adjustments in society. It is conceded that adjustments are desirable along these lines: (a) Less formal work purely for development of skill, (b) industrialization of subject matter, (c) greater emphasis upon collective effort, and (d) a keener recognition of the vital relat'on of manual training to vocational training and guidance.

Purpose.

"1. The school is recognizing more and more that the fundamental factor in the development of the individual is experience. In the case of the child, experience, to be profitable, must be concrete. Materials must be manipulated in order to learn their properties; appliances have to be used to learn their functions; devices have to be worked to understand their principles.

"2. Actual participation in fundamental productive or constructive activities is the most direct path for the child to a real appreciation of his social-industrial environment, and this experience as an interpretive background will enable him to assimilate from books much that would otherwise fail to function in his development.

"3. It is the fundamental purpose therefore of the manual arts subjects in school life to furnish to the child the opportunity for active constructive experience. The school should be so organized as to include the productive and constructive activities as vital part of the system.

"4. This purpose expressed in relation to the divisions of school life may be stated as follows:

"(a) The imperative necessity for providing a motive on the part of the child for acquiring information and knowledge discloses the primary purpose and aim of the manual arts work in grades below the sixth. Experience creates a desire for information. Constructive activity demonstrates a need for the tools of knowledge. The constructive activities of these grades therefore must be considered as a vital part of the system and not as an isolated subject. The time allotted to the manual arts in these grades should not be less than 15 per cent of the entire school time.

"(b) The specific purpose of the manual arts subjects in grades six, seven, and eight is to lay a broad foundation of experience and information that will assist each pupil to interpret the social forces at work in his environment, to the end that he may make a wise and intelligent choice of life work, and thus develop into an efficient and loyal citizen. This is the most effective kind of vocational guidance work.

"To accomplish this purpose our subject-matter must be reorganized and industrialized so as to provide the possibility of a wide variety of experiences that reflect the vast industrial and social life of our country. Thru this means natural aptitudes will be accentuated; industrial intelligence will be developed. This program will provide an efficient substitute for the activities formerly obtained on the farm by every country boy. Furthermore, this scheme will accomplish all and more than is claimed for the so-called prevocational school, and in addition it forms a logical preparation for the particular pupil who enters the industrial-vocational school.

"It can not be asserted too strongly, however, that this is preeminently the work of manual training. The vital relation that it bears to the entire school program distinguishes it from vocational training. It is the right of every pupil to have the opportunities suggested.

"Finally, the experience, the training, and the broad sympathy of the manual training teacher combine to point to him as the one to direct this task. This is the plan that this association presents as a justification for its demand for at least 20 per cent of the school time for the manual arts subjects in these grades.

"(c) Beginning with the ninth grade or first year of high school it is conceded that the purpose of the manual arts subjects may follow either of two diverging lines. For that large number who have not determined upon their sphere of life work the purpose of the preceding grades continues, while for those who have determined upon an industrial occupation the purpose becomes purely vocational. For the latter group, the time allowance should be at least 50 per cent of the entire school time.

Conclusion.

"This association expresses its convictions:

"(1) That the achievement of the purposes of the manual arts subjects in the school program as set forth in this report is essential to the fullest development of citizenship in an American Commonwealth.

"(2) That the greatest obstacle to the accomplishment of these purposes in the past has been an inadequate amount of time, which, according to reliable investigation, has been found to average thruout the country less than 90 minutes per week.

"(3) That one of the most pertinent questions for consideration by educators and laymen alike is that of adequate time which should be accorded the manual arts subjects in the general plan of school studies in order to produce a balanced program of study and activity.

"Furthermore, this association challenges a test of the program suggested, especially of that for the development of the purposes of manual training as set forth for grades six, seven and eight.

"Finally, we reiterate our statement of one year ago, 'that the criticisms directed against the manual arts subjects and their effect on the general scheme of education are practically nullified when reduced to terms of time allowance.'"

INDUSTRIAL SURVEY AT TOPEKA.

An industrial survey of the different classes of employment of Topeka, Kans., has been completed recently by J. F. Kaho and C. H. Hepworth of the high school. The survey, which was made for the vocational guidance of the high school students, gives information relative to wages, number of workers, hours of work and working conditions of

some 36 different employments. About 134 firms are represented.

Following is a short summary of the results: Unskilled laborers to the number of 735 were receiving $11 per week; 129 stenographers, $14 average; 696 skilled laborers averaged $18.25; 523 in office work, $19.35; salesmanship, 1,015, $26.60; 103 department managers, $35.

Different business men were also asked what qualities they desired first and foremost in their employees. Following are some of the answers: Automobile men, ability, confidence, honesty and industry; bakeries, ambition and good habits; druggists, application and attention, honesty and neatness; iron workers, ability, accuracy, originality and no cigarettes; banks, concentration and honesty.

A vocational guidance chart with complete tables for each phase of the study has been prepared for use during the next school year.

SOME RESULTS OF THE MINNEAPOLIS SURVEY.

The National Society for the Promotion of Industrial Education has issued a statement of the results of the Minneapolis Industrial Education Survey which have become evident during the past year. Readers may judge for themselves just how valuable the survey has been in arousing interest and securing a participation in vocational opportunities:

1. As a result of the interest and hearty support of employers and employees won by the survey, the total registration of evening school students for the year in Minneapolis was increased 1233. All of this increase was made up of people employed in the trades, industries, and occupations. Evening school courses were open for the first time giving trade extension training in the following lines: Architectural drawing, automobile construction, bakers' chemistry, bricklaying, building foremen, cabinet making, carpentry, cost estimating, electrical work, engineers, firemen and janitors, industrial design, interior decorating, machine shop instruction, machine design, painting, plastering, plumbing, printing—composition, printing—presswork, sheet metal drafting, steamfitting, stone cutting, telephony and welding.

2. A dull season class for bricklayers of 16 apprentices was opened for the first time during the months of January and February. These apprentices attended school all day and were paid half their usual wage by the contractor.

3. The attendance at the Girls' Vocational High School increased from 90 to 498, or 18%. New courses were opened in junior nursing and machine operating. Part-time classes in salesmanship were established, and evening trade extension classes for women employed in the trades were started.

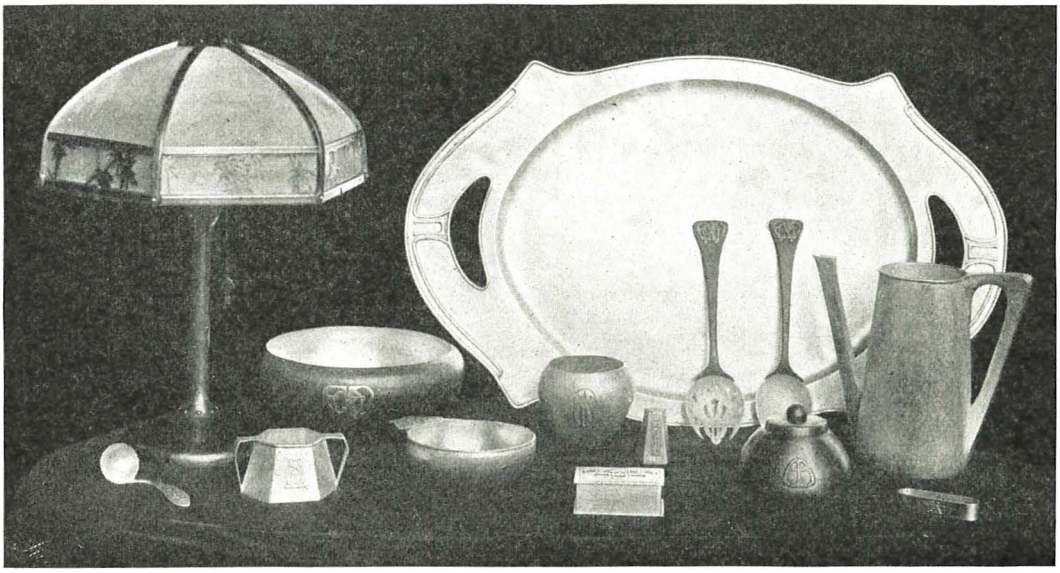
4. The day school in the Dunwoody Institute increased its registration from 80 to 300, an increase of 27%. A new course was opened in telephony with an enrollment of 15 boys.

5. A technical course was established in the New Central High School Building, four years in length, preparing boys to go out into industry on the business and directive side. This work started out with an enrollment of 106 boys. Business men of the city have agreed to employ graduates of this course at an initial salary of not less than $50.00 per month.

6. A two-year course in commercial education is to be offered in the five high schools of the city for the coming year. This means the gradual supplanting by the public schools of the five business colleges in giving young people preparation for commercial work free of charge.

7. The four-year course for commercial work is now being overhauled by an advisory committee which came out of the recommendations of the survey, and the new course will be much more practical and thoro in preparing young people to meet the demands of modern business life.

8. Advisory Committees have been formed, made up of employers and employees, to assist the schools in making the work successful in the following lines of training: Automobile construction, bricklaying, carpentry, printing and telephony, commercial education, salesmanship, technical training, dressmaking, millinery, machine operating, household arts and junior nursing.



Students' Art Metal Work, Milwaukee-Downer College.

9. Trade understandings have been worked out between the school and the trades and industries which have received the approval of both employers and employees in the following lines: Automobile construction, carpentry, bricklaying, electrical work, machine shop practice, painting, plastering, printing, plumbing and steamfitting.

10. These trade understandings make the two-year course of work in the industrial school equivalent to two years of apprenticeship in the trade. Employers agree to come to the school to get new workers and to employ these new workers at a third-year apprentice wage. The diploma of the school is to be withheld until after one year of actual work in the trade or industry and proof of satisfactory service from the employer. These arrangements cover the following lines: Automobile, printing—composition and presswork, carpentry, cabinet making, electrical work and telephony, commercial training, salesmanship, dressmaking, millinery, machine operating, junior nursing. Attention has already been called to the arrangements with the business men of the city concerning graduates of the four-year technical course at the Central High School.

11. As a result of the survey, evening school instruction in telephony has been also established in the city of St. Paul where more than 200 men were enrolled last winter.

12. Correspondence school instruction is now being carried on for the telephone men in the State of Minnesota. No man is eligible unless he has finished the eighth grade and is employed in telephone service, as it is felt that correspondence school instruction would not otherwise be successful.

13. A uniform form of apprenticeship agreed to be used in the employment of all apprentices in the different trades who come from the Dunwoody Institute has been worked out and is now under process of adoption by the trades. Thus far it has been adopted by the automobile trade and is certain to be adopted in the following lines: Machine shop, printing, carpentry, cabinet making, electrical work and telephony.

14. The Vocational Guidance Department of the Public Schools is using the findings of the survey as the basis of its work in the furnishing of information concerning occupations to the teachers and children of the public schools of the city. The separate chapters of the survey are now being printed in pamphlet form for use in this way, and the studies carried on by the survey are now being extended to cover other fields and other phases of employment in trades and industries already studied.

15. In April of this present year, 700 men received certificates showing that they had completed one or more short unit courses in the Dunwoody Institute. These courses were courses which had been worked out and advanced by the trades and received their approval. In fact, all courses now being taught referred to in any of the above material, came about as a result of many conferences with the trades and have met with the approval of the trades, as the great increase in registration in the different lines shows.

16. The findings and recommendations of the survey have committed the city of Minneapolis absolutely to a growing and determined program of Vocational Education from which the city will never turn back. It brought close and intelligent working relations between the board of education, the University of Minnesota, the Dunwoody Institute, the Y. M. C. A. and the Minneapolis Art School. Plans for co-operating and for a possible division of the work are now being worked out thru conference committees between these different organizations.

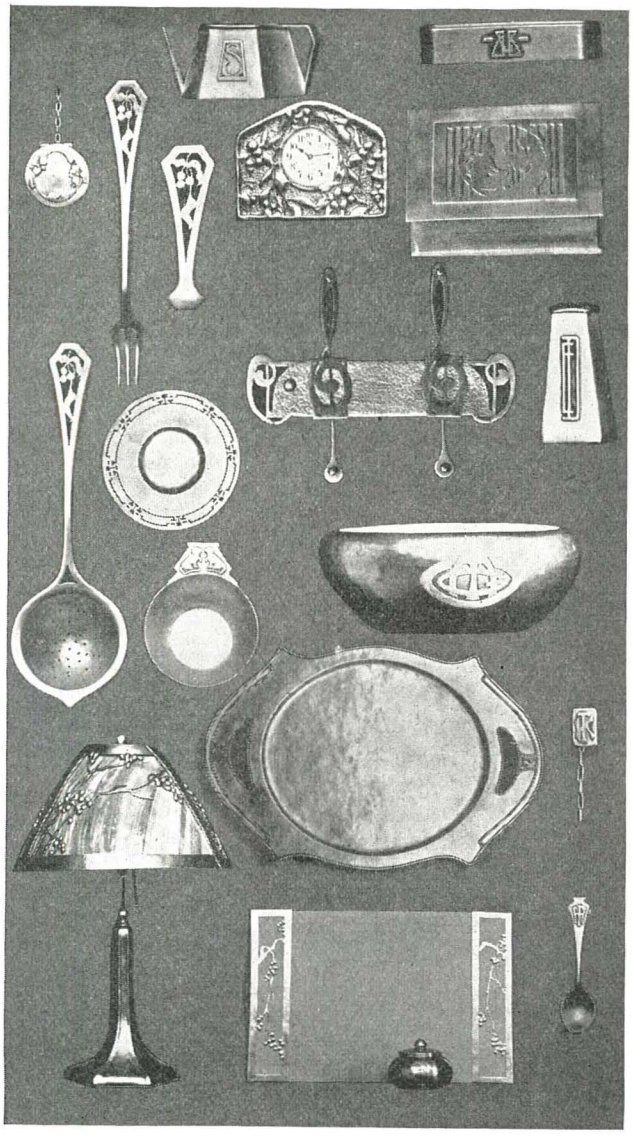
17. As a result of the findings and recommendations of the survey, the public schools are now rapidly establishing Junior High Schools which meet the needs of this city, the prevocational work in industrial and mechanical arts in these Junior High School centers being carried on in an experimental way, the co-operation between the Dunwoody Fund and the resources and administrative machinery of the public schools.

18. The findings of the survey will result within the next twelve months in the establishment of the following additional courses in the William Hood Dunwoody Industrial Institute: Baking, foundry, sheet metal work. This will make a total of eleven trades taught in the day classes of the school. At the mid-year, 120 applicants for admission to the school were refused for lack of room. When the school enters its new quarters in February, 1917, it seems certain that there will be a registration of at least 600 in the day school, which will mean that since the school has started registration has leaped in less than two years to a total four times as great as that of the registration of the school at the start.

The city has benefited from the survey in a number of different ways:

1. For the past seven or eight years the whole question of vocational education has been a much agitated issue in the city, but the city had no facts upon which to act. The findings and recommendations of the survey have supplied a program on which everybody has entered with confidence.

2. The city has, of course, received a great deal of publicity thru the distribution of the survey report as made thruout the country. Six thousand copies of the report were published at the outset and 20,000 reprints are to be made by the Bureau of Labor Statistics at Washington, making a total of 26,000 copies circulated thruout the country dealing with the industrial and business enterprises of the city of Minneapolis and showing the wonderful prosperity of the place and also the determination of the city to deal with any problem of vocational guidance and vocational education in an intelligent and scientific way.



Jewelry Work, Milwaukee-Downer College.
Miss Grace Upham, Director.

3. In the opinion of the Board of Directors of the Civic and Commerce Association here, the city has leaped forward 25 years in its consideration of the whole question. Perhaps the greatest benefit of all is the community physchology created. As a result of the survey there was brought out a better understanding and better feeling in all classes not only with regard to training of workers but with regard to their relations in civic and industrial life.

A CRITICISM.

To the Editors:

I assume that anyone who submits an article or a design to the public thru a periodical, gives that public the right of criticism. On this assumption I am, therefore, offering this animadversion.

In the August number of the *Industrial-Arts Magazine*, on page 369, I was interested in the "Hall Clock," by Clark Woodward, Murfreesboro, Tenn. I offer no criticism of the general design, for the nice refinements of a piece of furniture cannot be explained within the limits of a letter, but I do wish to severely censure the shingled top of the clock. Here is a glaring sham which does in no respect justify its existence.

This type of imitative design is such a common misconception of proper decoration that I take this opportunity of discussing it. It is in the category of the inverted tall hat match safe, the pig bank, the leg pincushion, the crocodile nut-cracker, the turkey-leg thermometer, claw feet, fruit electric light bulbs, dog door-stops, lion head arms on chairs and a host of other American horribles.

Of course we know they are not what their shape and mimicry indicate, but why in the name of sound reason should they indicate what they are not—again I know that it is to tickle one's fancy, but let us away with such fancy and stick to fact.

Now for Mr. Woodward's clock. In the first place it 's a *Hall* Clock, therefore, I assume that it is to abide in a hall, inside a house, and consequently protected from the elements outside. Such being the case there is no reason why one should shingle the top, or in fact place anything there except a dustproof top to prevent dust from settling beneath. Sound cabinet construction offers much in the way of suggestion for this.

In the second place the actual design as drawn in the illustration shows not real shingles but "imitation" shingles, made "by sawing and grooving them from a solid board glued up." From the standpoint of industrial efficiency this is a great waste of time to no purpose. From an art standpoint it is a makeshift of the real thing, both of which are inconsistent and quite out of place. It is high time we talked of art efficiency also.

Such mistakes are common to both art and industrial teachers but can we not constantly ask ourselves *why* we do certain things and then test the result with sound common sense? I trust that Mr. Woodward will forgive me. The criticism is for general application and this excellent problem presented the opportunity.—*Royal B. Farnum, Albany, N. Y., July* 13, 1916.

DOMESTIC SCIENCE IN A COUNTRY SCHOOL.

Hot lunches have been successfully served to transported children, who previously had been obliged to bring cold food, in the Mendham Boro School at Mendham, N. J. The successful experiment is described in the official bulletin of the New Jersey State Department of Public Instruction:

"From September to January, inclusive, the lunch room was in charge of the seventh and eighth grade pupils, twenty-one in number; from February to June, the high school took charge.

"The pupils were divided into squads of four and five, and were under the supervision of the domestic science teacher. Each squad was responsible for one day a week, averaging during the season eighty hours of work. They marketed, cooked and served the lunch, keeping note-books with bills of fare, quantities and prices.

"Twice during the winter the local butcher gave a demonstration in the domestic science department, cutting up the fore and hind quarters of a steer and explaining the uses and prices of the various cuts.

"Two pupils remained after school hours to wash dishes and put the room in order, for which service each received fifteen cents a day.

"The lunch room opened the first day of the school year and since then has served never less than eighteen and frequently as many as forty pupils. The menus included meat or a meat substitute with a vegetable and bread and butter, for five cents; a glass of milk for three cents; dessert or cocoa for two cents. After the first few weeks the lunch room became self-supporting.

" A number of difficulties had to be overcome in working out the plan.

"The domestic science teacher is in charge of the entire manual training department and while supervising the lunch squad conducted classes in an adjoining room in either sewing or carpentering.

"In the academic department it was necessary to arrange the weekly schedule in such a way as to avoid any loss to the absent pupils.

"To make the lunch room self-supporting, it was impossible to include the more elaborate dishes which it was desirable the girls should learn to prepare. This difficulty was overcome by appropriating from the domestic science fund an amount considerably less than that which had been spent on cooking supplies before the lunch room came into existence. These extra dishes were added to the bill of fare without increased charge."

NATIONAL AID TO VOCATIONAL EDUCATION.

In the beginnings of the United States education was considered a community business because it was assumed that each locality could take care of itself. It was later learned that the state had decided interests in education because people did not remain permanently in any one locality and hence it was a necessity for the state to see that each community did its whole duty in caring for the education and training of youth that the developments of time had shown were citizens of the state rather than of the community. A more extended experience with government, a larger development of opportunities, a wider expansion of human interests, a greater acceptance of people from the whole world have brought the conclusion that the work of educating the masses is a national problem of the broadest significance and is no longer a state problem with single state interests.

Vocational education has become a great necessity in the past quarter of a century and the local communities and the states are doing what they can co-operatively to get the work that is needed well done. Since the world contests are between nations as regards commerce, manufacturing and production of all kinds, it is necessary for the United States to co-operate largely with the separate states in vocational education if our people are to be qualified to protect their own interests and the nation's efficiency their combined efforts by the results that they can show in the next quarter of a century will see a vast multitude of variable developments in society and in prosperity. This exigency cannot be met unless all the factors co-operate to reach the children in the school and send them forth qualified to produce the things the world needs.

Certain vocational bills have been before Congress for some years. They are competent to meet the needs that education shows. They are humanitarian rather than utilitarian. They are for future prosperity rather than present prosperity, they are altruistic rather than selfish and hence it is easy to postpone them from year to year and from Congress to Congress because the temporary is more appealing than the permanent and because property and resources and rivers and harbors and industrial expansion and military necessity are more actively urgent than the demands of the future citizens now in childhood and youth. American thrift, American independence, American efficiency, American attainment of power all depend upon the recognition of the most cordial co-operation of the nation, the state and the community in the education and the training of all the people.—*Homer H. Seerley, President Iowa State Teachers College.*

SOME THINGS A NEW INDUSTRIAL SUPERVISOR HAS TO LEARN.

Samuel J. Rowland, Division Industrial Supervisor, Antique, P. I.

1. Not to talk too much; not to lose his temper over small matters; to use much tact and discretion when inclined to criticise, and to reserve all criticism not of a constructive nature. These elementary lessons ought, of course, to have been learned by any civil-service employee who comes out here; but I hadn't learned them thoroly enough.

2. The patience of the "old-timer" in the Philippines. It is very necessary that the new industrial supervisor cease to think that things can be done on time here as at home. He must learn from those who have been here before him that things are not done here in a hurry.

3. The importance of ceaseless care in the selection and preparation of material. The Filipino child is subject to the same temptations as the American is in regard to doing a thing in the easiest way.

4. The value of comparison and competition in industrial work.

5. The importance of definiteness in instructions and programs. Some teachers, when they finish a piece of work that is laid out for them before further orders reach them, do not begin anything else until the supervising teacher or the industrial supervisor visits them again; consequently the industrial supervisor must look a long way ahead in making plans.

6. The importance of being able to show things in industrial work instead of telling about them. An industrial supervisor ought to be able to do the things that he tells his teachers to do. A new industrial supervisor has not this knowledge and often feels the lack of it.—*The Philippine Craftsman.*

NEW BOOKS AND PAMPHLETS

Hand Wrought Jewelry.

By H. R. Sorensen and S. J. Vaughn. Cloth, 102 pages. Price, $1. The Bruce Publishing Co., Milwaukee, Wis.

The making of jewelry is becoming each year more popular as an advanced art-craft subject in high schools and colleges, as its value culturally and vocationally is growing to be understood.

The present book is an elementary text for classroom use. It takes up, in detail, all of the processes and methods of making jewelry from the making of the simplest fob to the difficult working of intricate patterns and mounting precious stones. The authors have had years of experience not only as craftsmen jewelers but also as teachers and they present each topic with the certain knowledge of the difficulties which students will have. The book takes up among other topics the making of fobs, bar pins, scarf pins, chains, rings, pendants, monograms, setting stones, mounting odd-shaped stones and pearls, etc. The book is fully illustrated with photographs and line drawings to emphasize difficult processes. Several hundred outlines of suggestive designs which may be worked out by students are added.

Thruout, the authors emphasize the need for good design as well as good workmanship. They hold that crudeness and clumsiness are not compatible with the conception of truly successful craftsmanship.

The book should prove valuable not only for teachers and students of jewelry making but also to craftsmen and amateurs.

A Laboratory Manual of Foods and Cookery.

By Emma B. Matteson and Ethel M. Newlands. Cloth, 325 pages. Price, $1.50. The Macmillan Company, New York, Chicago.

This manual is intended for advanced students of cookery who are preparing to teach the subject or who intend to become professional chefs or dieticians.

It is arranged topically according to the usual classification of food materials and considers each kind of food chemically, bacteriologically and biologically. The authors have employed not only the experience of many years but have added the experience of several other teachers. The experiments are therefore well tested. A large number of recipes is added to each chapter and score cards are printed to give students a definite form for judging the finished product. A final chapter includes a considerable number of recipes for institutional cooks.

Needlework Without "Specimens."

By Ellen P. Claydon and C. A. Claydon. 237 pages. Price, $1.50 net. E. P. Dutton & Company, New York.

This book presents useful exercises for sewing in the common schools.

It is written by English teachers of needlework and the exercises are arranged for seven "standards" or grades of the public schools.

A great variety of sewing exercises of useful sorts are illustrated and explained in detail.

For the lower grades, doll's garments and simple, useful domestic articles are described.

For the upper grades, children's garments of simple design and mending are presented.

This should be a helpful book for the teacher of practical sewing and a source of many exercises from which to choose.

A Guide to the Works of Art in New York City.

Florence N. Levy, New York City, Editor and Publisher. Cloth, 60 pages, 49 illustrations. Price, 50 cents.

The traveller in America finds few concise and adequate guides to the art interests of our cities. This little book serves such a purpose for New York. It is written by one who knows the Art of New York thoroly and has a conception of its comparative value.

A map of the city and plans of the Metropolitan Museum are given in the guide book.

The description of desirable tours about the city gives the tourist just the information needed.

Industrial Arts Design.

By William H. Varnum. 248 pages. Scott, Foresman and Company, Chicago; New York

This is a textbook on practical methods in design for students, teachers and craftsmen

The principles of design relative to the construction, material and use of various objects of the industrial arts are clearly stated and splendidly illustrated.

Many specific rules are formulated which bear upon special conditions of construction, use and materials so that the teacher may give definite instruction for the development of designs in the manual arts.

Review questions at the end of each chapter help the teacher to cover the text in class periods.

In addition to principles and rules of form for design, three chapters are devoted to color in its relation to industrial arts design.

This book will fill a great need in the development of instruction in design relative to the manual arts.

A History of Sculpture.

By Harold N. Fowler. 445 pages. 195 illustrations. The Macmillan Company, New York; Boston; Chicago.

A well written and well illustrated survey of sculpture from the beginnings of civilization to the present time.

The book should be serviceable for reference and as a college text. The text is arranged in order of historical development of sculpture with clear statement of historical conditions and brief critical comment.

Industrial Art at Home and Abroad.

By Dr. James P. Haney. Paper, 16 pages. The Prang Co., Chicago.

The growing acceptance of the significance of industrial art is well illustrated in this address of Dr. Haney before the largest business organization of Chicago. The economic importance of the art problem, now and in the near future, is emphasized.

Bulletin of the Carnegie Institute of Technology.

General catalog 1915-16. Published by the Carnegie Institute, Pittsburgh, Pa. The pamphlet gives a summary of the student registration for 1915-16; a general statement of the location and arrangement of buildings, scholarships, living accommodations and expenses, student activities and alumni associations, facilities for instruction, courses offered, tuition fees, entrance requirements and special courses for teachers.

Conferences of Teachers.

Bulletin No. 14 of the Wisconsin State Board of Industrial Education for 1916. Published by the State Board at Madison, Wis. The pamphlet lists the proceedings of the seven conferences held at Beloit, Appleton, Marshfield, Kenosha, Two Rivers, Menomonie and Milwaukee, and reproduces the addresses of the different speakers.

School Credit for Home Practice in Agriculture.

By F. E. Heald. Bulletin 385, United States Department of Agriculture. The pamphlet aims to assist the rural

teacher in her part of the problem of administration of the rural schools, and to discuss the basis of such credit for the benefit of school officials who may desire to install such a plan. Several farm-management studies are utilized to assist both the teacher and the officials. The pamphlet discusses methods for the teacher's use, essentials of co-operation, credit for home practicums, school administration basis of credit, farm management basis of school credit, projects with animals, supplementary tables of labor requirements and selected club records of boys' and girls' work.

The Climax. Yearbook of the high school, West Allis, Wis. A very creditable school publication—editorially and typographically.

Hazards in Handling Gasoline. By G. A. Burrell. Technical paper 127. United States Bureau of Mines, Washington, D. C. This pamphlet is of general interest; it treats of the inflammability of gasoline vapor and the precaution to be observed in using gasoline. Copies may be had gratis from the Bureau of Mines.

The Edison Alkaline Storage Battery. National Eduation Association Joint-Committee Series. Monograph III.

A very complete technical description of the manufacture, characteristics, chemistry, and design of Edison batteries. The monograph will be especially valuable in all classes for electrician apprentices.

Copies may be had gratis from the Edison Storage Battery Company, Orange, N. J.

Sheep and Swine. Instructor Literature Series No. 272. By Charles Sumner Plumb. 30 pages. Price, in paper covers, 5 cents. Published jointly by F. A. Owen Publishing Company, Dansville, N. Y., and Hall & McCreary, Chicago, Ill.

Report of British Departmental Committee on the Danger in the Use of Lead in the Painting of Buildings. Bulletin No. 188 of the United States Bureau of Labor Statistics, Industrial Accidents and Hygiene Series.

Worcester, Mass. A class of 66 was graduated at the recent joint exercises of the boys' and girls' trade schools.

Benton Harbor, Mich. The manual training department is to be broadened in scope next year thru the establishment of a course in machineshop work. The new course has been made possible thru a gift of $1,000 by eight manufacturing institutions of the city. In addition, the firms have offered to supply the classes with raw material free of cost.

Washington, D. C. The manual training teachers in the grade schools of the district have asked for a raise in salary. The teachers point out that they receive lower salaries than instructors in academic subjects despite the fact that their work has gained in importance since the demand for trade instruction. They also show that their salaries remain where they were 25 years ago, while the cost of living has steadily increased.

Boston, Mass. A co-operative day course has been established in the East Boston High School.

Diamond Hill, Tex. A course in concrete work is planned for next year.

Milford, N. H. A course in mechanic arts has been introduced in the high school. Mr. Roy Kimball, of Boston, Mass., will be in charge.

The industrial and vocational survey of Indianapolis, now in progress, will cover 24 phases of the industrial life of the city and eleven of the educational system. The subjects have been selected with a view of the effect of the survey thruout the state as well as Indianapolis. This is true of the electric industry which includes so many different phases of the electric service.

In the study of the colored people, the work will eventually result in the expansion of the present occupations and a direct influence on thirty thousand colored persons.

The list of subjects for the industrial survey includes the automobile industry, printing, concrete construction, molding and founding, woodworking, construction of wagons, carriages and automobile bodies, the electrical industry, car and railroad shops and engineering, colored employments, professional and home nursing, art in industry, clothing and building trades, metal products trades, baking, millinery, sewing and dressmaking, home wage workers, canning and commercial training.

The vocational survey includes a study of evening classes, prevocational classes, manual training, trade education, technical education, vocational guidance, co-operative education, part-time education, continuation education, prevocational centers, special classes, legislation for minors between 14 and 16 years, employed or non-employed and non-wage earning boys and girls at home.

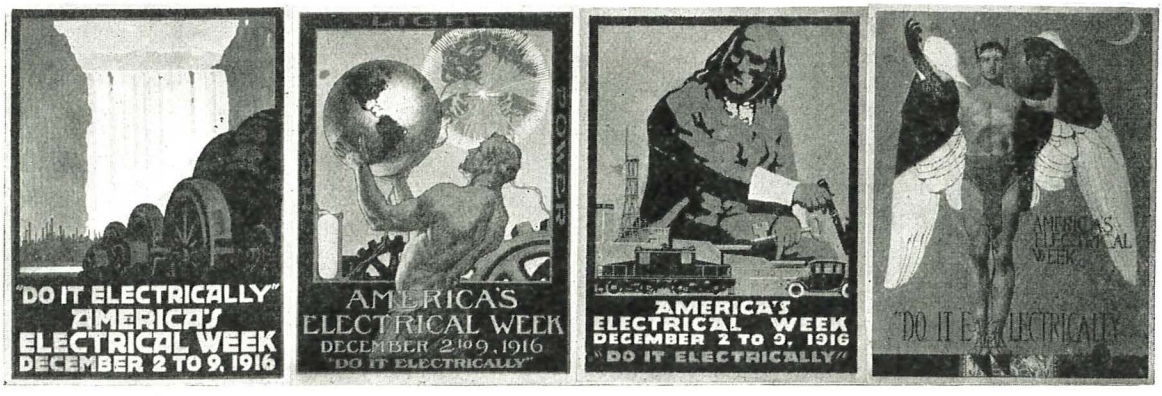
The Rockefeller Foundation has announced that it will shortly resume the study of the Gary school system, preliminary work on which was done during the spring. Mr. Abraham Flexner will direct the study and Mr. Frank H. Bachman will assist him. Prof. C. R. Richards of Cooper Union and Mrs. Eva W. White of Boston will be associated as experts in the investigation of special phases of the Gary plan.

Dubuque, Ia. Concrete construction and pattern-making will be introduced in the high school under Mr. L. I. Martin.

Mr. A. E. Jones has been appointed instructor in farm mechanics at the Reno County High School, Hutchinson, Kans.

Miss Edna Endly of Mansfield, Ohio, has been appointed head of the domestic science and art department in the high school, Wooster, O.

Miss Cleo Murtland' has resigned as assistant secretary of the National Society for the Promotion of Industrial Education.



A few of the Designs recently submitted in the National Electrical Poster Competition.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for the convenience of subscribers who may have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from persons who are competent to answer. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any question and reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis

Fuming Red Oak.

To the Editors:

In looking thru your magazine, I noticed an answer in it about "fuming red oak," and to prevent some innocent person from spoiling the interior trim of his or her house, I trust you will get the following in your valuable paper.

I have been finishing all kinds of woodwork in fumed colors for the past 15 years, and anyone who knows red oak, or poplar, white or other pines, should know that they cannot fume them by *ammonia* alone.

Anything that is added to the surface acts as a stain, and the fuming penetrates only as deep as the stain.

Tannic or pyrogallic acid added to surface and fumed is not as good or satisfactory as staining.

You may color the surface, and put any kind of varnish over it but if you want a good job, my advice is to stain it.

Yours truly,

J. B. Williams, 689 Walker St., Milwaukee, Wis.

Sheet Metal Work.

385. Q.—Just what part is sheet metal work taking in Manual Training? By that I mean is it a coming subject or merely a substitute for the more expensive courses such as machineshop work?—*C. O. G.*

A.—Sheet metal work is growing slowly but steadily in popularity. It has definite vocational value in any community. It is by no means a substitute for machineshop work.

A School of Wheelwrighting.

423. Q.—Do you know of any school offering courses or books about wheelwrighting?—*G. F. B.*

A.—We do not. Perhaps some reader can suggest a school.

Drawing Text.

426. Q.—Please recommend a text in elementary cabinet drawing that might be used in the Sophomore year in high schools.—*C. H. S.*

A.—*Problems in Furniture Making* by F. D. Crawshaw, (Manual Arts Press, Peoria); *Furniture Designing and Drafting* by A. C. Nye, (Periodical Publishing Co., Grand Rapids, Mich.)

Plasticine.

434. Q.—Wish to make a model of an open-hearth furnace. Would you recommend the use of "plasticine?" If so, would you kindly tell me where I can procure the same? —*C. C. C.*

A.—Yes. Thomas Charles Company, Chicago.

Installing Machinery.

435. Q.—1. In installing woodworking machines, like universal saw-jointers and band-saws, is it necessary to have special foundations? 2. Is a two-inch plank floor tongued and grooved, of four-inch surface, nailed to heavy furring set in concrete sufficient?—*A. R. M.*

A.—1. No. 2. Yes.

Art Metal Work.

455. Q.—Have you any good book on "hand-hammered, thin, metal door plates?"—*D. P. M.*

A.—*Payne's Art Metal Work*, $1.50, Manual Arts Press, Peoria, Ill.; *Rose's Copper Work*, $1.50, Atkinson, Mentzer & Co., Chicago; *Haas's Art Metal Work and Jewelry*, Sequoyah Publishing Co., Oswego, N. Y.

The Making of a Tennis Net.

456. Q.—On page 225 of the May issue of the *Industrial-Arts Magazine*, Mr. Leslie W. Bailey describes the making of a tennis net. Can you give me any further information concerning the making of this net? What does "a quantity of seine twine" mean?—*M. G.*

A.—The seine twine mentioned in Mr. Bailey's article can be had from any ship chandler or from almost any sporting goods store. Size 9 or 12 will be satisfactory, and about four pounds should be sufficient. However, any good strong cord will answer the purpose. A cord that has been found very satisfactory and which is known as "macrame cord" may be obtained from Beckley, Cardy & Co., of Chicago, at 15 cents a ball. Six balls of this cord will make a tennis net of suitable dimensions.—*Leslie W. Bailey.*

Publication on Gem Stones.

457. Q.—Can you recommend a handy publication on gem and semi-precious stones such as may be used by a high school class in jewelry work?—*A. G. B.*

A.—The booklet "A Guide for Gem Buyers" is the best work we know of. It may be had without cost from The Espositer-Varni Company, 49 John Street, New York, N. Y.

NEWS NOTES.

Minneapolis, Minn. A test of the vocational high school plan is to be made in the Seward and Bremer Junior High Schools this fall. A three-year course offering agriculture, printing, woodworking, electrical working and metalworking will be provided. All courses are open to girls but particular emphasis has been placed on home management and domestic science.

Rockford, Ill. A summer course in manual training was conducted during July under the direction of Director M. D. Jones. There was no tuition but boys were required to pay a small fee to cover the cost of materials.

New York, N. Y. A class of 32 women from eleven departments of Stern Brothers Store recently received certificates on the completion of the course in salesmanship. The present class is the fourth since the educational system was begun in February, 1915, and the total number of trained saleswomen now reaches 189.

Indianapolis, Ind. The board has received preliminary plans from Architect J. Anton Scherrer for a three-story building to be added to the Emmerich Manual Training School. The building will include an auditorium and a gymnasium and will cost $150,000.

Johnstown, Pa. A thoro reorganization of the manual training department has been planned for the next year. The new plan which offers to all boys practical work in addition to theoretical study, provides for a preliminary training, for actual repair work in and around the school and for advanced training in the trades. The latter includes courses in bricklaying, concrete work, sheetmetal work, woodworking, patternmaking and cabinetmaking.

Boys in the sixth, seventh and eighth grades will be given a choice of courses. Their progress will be watched and their skill and natural ability will be noted. As part of their work they will be expected to undertake general repair work under the direction of a carpenter. In the high school the boys will have made a definite choice in the trade which they wish to follow. They enter upon their training and continue in the same until the completion of the course.

A system of vocational training for Indian children who are not enrolled in public schools will shortly be introduced in 24 western states. The country is divided into six districts with headquarters at Santa Fe, N. Mex., Riverside, Cal., Salem, Ore., Rapid City, N. D., Tomah, Wis., and Lawrence, Kans. The work is under the direction of Commissioner Cato Sells of the Department of Indian Affairs, Washington, D. C.